

ARCHIVES OF OTOLOGY.

ON THE THERAPEUTIC VALUE OF VIBRATORY MASSAGE OF THE DRUMHEAD.

By DR. SCHWABACH, OF BERLIN.

Abridged and Translated by Dr. H. KNAPP.

IN the following pages I purpose to make known the results which I have obtained by the massage apparatus driven by an electric motor recommended by Breitung¹ for treating the different kinds of ear disease and progressive deafness, especially that known under the name of sclerosis. Breitung recommends that we should begin with the smallest number of excursions of the piston, and very gradually increase the number of vibrations. Thus far he has not used more than five piston-excursions of the scale. Very early he noticed a marked influence on the subjective auditory sensations produced by very rapid small vibrations. After vibrations had been applied for from one quarter to one half a minute the tinnitus disappeared almost regularly in every case, in some cases for several hours, in others for a longer time. There was, however, no case in which the tinnitus disappeared permanently. He assures us that, with careful handling, no unpleasant sequelæ follow the tympanic vibrations. The treatment ought to be continued for a long time, or permanently, for the object was, by rhythmical oscillatory movements of the drumhead and of the ossicles, to exert a gymnastic influence in order to obviate the progressive stiffness and ultimate ankylosis of those parts. In a later publication² he refers to improvement

¹ "Experimental Investigations on Massage of the Ear," *Arch. f. Ohrenheilk.*, Bd. 44, p. 201, u. Bd. 45, p. 39.

² *Monatsschr. f. Ohrenheilk.*, 1899, No. 8.

in acuteness of hearing by the use of his apparatus. In a respectable number of cases the patients were able to enjoy the visits to churches and theatres, and in a majority of cases those to operas and concerts. He says that there was no doubt that the effect of highly frequent concussions extended as far as and beyond the nervous apparatus. Ostmann¹ states that the objective conditions were changed in no case, and in none were the subjective noises aggravated; on the contrary, they were essentially improved, without, however, disappearing altogether. During the treatment the intensity of the subjective noises varied, but they reached their primary intensity again. The lower tone limit was often materially extended, and the duration of perception of the octaves from C—c^v repeatedly showed considerable increase. Ostmann considers vibratory massage indicated (1) in cases of chronic deafness from chronic hypertrophic middle-ear catarrh; (2) in cases of hardness of hearing remaining after the termination of an acute inflammation of the middle ear, as adjunct to the ordinary methods of treatment. It is contra-indicated in (1) all acute inflammatory conditions of the sound-conducting apparatus; (2) in affections of the sound-perceptive apparatus with normal sound conduction; (3) in middle-ear affections which have led to marked displacement (retraction of the chain of ossicles, simple chronic middle-ear catarrh) or to extensive atrophy or adhesion of the drum. The prognosis in a number of cases was very uncertain. We may assume that by a treatment of four weeks all possible results would be obtained. The effect of the vibratory massage did not depend upon mechanical concussion of the sound-conducting apparatus alone, but upon the improvement of the nutritive conditions of the tympanic mucous membrane.

Zaalberg has thus far treated one hundred patients with Breitung's apparatus, and has occasionally noticed a considerable improvement in hearing in sclerosis, whereas the tinnitus nearly always disappeared²; he obtained an essential improvement of subjective noises in nineteen out of twenty

¹ *Zeitschr. f. Ohrenheilk.*, Bd. 35, p. 287.

² *Monatsschr. f. Ohrenheilk.*, 1900, No. 8, p. 309.

cases of sclerosis. Charles S. Burnett¹ thinks that the inflation may be always replaced by massage, and speaks favorably of the results obtained, particularly in cases of chronic middle-ear catarrh with reaction of the drumhead and the ossicles. Panse,² at variance with the continuously repeated recommendations, says that massage is almost always without effect in sclerosis for the reason that it may loosen the incudo-stapedial articulation, and that it has scarcely any effect on the foot-plate of the stirrup. In chronic middle-ear catarrh, however, he recommends massage, combined with the use of the catheter. Lucae³ is not in favor of the massage apparatus.

My own observations refer to 173 cases, 70 of one-sided, 103 of double-sided, affections of the auditory organ, on the whole, 276 affected ears. Massage was supplied by the Breitung apparatus put in motion through the electric street current in such a way that there were daily applications with low velocity, namely, 600 piston-excursions of 2 mm each. The number of excursions was gradually raised to 1200, corresponding to the current strength of $\frac{1}{2}$ ampère also with excursions of 2 mm. Greater excursions up to 5 mm were rarely used for they produced unpleasant vertigo. It is not necessary to supply the end of a Siegle's pneumatic speculum with a rubber tube. The duration of the seances was ordinarily one, two, rarely three, minutes. The tinnitus not rarely stopped a short time after the first sittings, for some minutes up to several hours. Longer treatment was given only to patients who positively asserted that they were materially improved. Some patients alleged considerable improvement in hearing which an objective examination did not confirm. The results of vibratory massage which I am going to report refer exclusively to cases which had been under observation from two months to two years or longer after the termination of the treatment.

I began the use of massage first in **cases of sclerosis** of the sound-conducting apparatus. I call sclerosis that form of ear affection which is distinguished (1) by progressive

¹ *Transact. of the Amer. Otol. Soc.*, 36th meeting, vii., 2, 1899.

² *Encyklopaedie d. Ohrenheilk.*, Herausgegeben von L. Blau, p. 293.

³ *Arch. f. Ohrenheilk.*, Bd. 47, p. 224.

deafness; (2) by absence of objective changes in the tympanic cavity and drumhead (dulness and retraction); (3) by a shortening of the lower end of the tone series, by prolongation of the duration of perception for deep tones by bone-conduction, and negative or greatly shortened positive result of Rinne's experiment (Bezold's Triad). With regard to the alteration found by functional examination, mentioned under (3), we may assume that they essentially depended upon fixation of the sound-conducting apparatus, chiefly the foot-plate of the stirrup, most probably resulting from a primary affection of the labyrinth capsule, and not upon any catarrhal processes of the tympanic mucous membrane (according to the investigations of Bezold, Politzer, and Siebenmann). The acuteness of hearing was greatly diminished in all cases. I should not omit to mention that I gave little hope to patients with high degrees of deafness presumably caused by pronounced, and therefore irreparable, anchylosis of the foot-plate of the stirrup.

In 81 auditory organs, 67 suffered from subjective noises, mostly with very unpleasant sensations of stupor. In all of the 81 auditory organs the deepest tones of the musical scale, 16, 32, 48 double vibrations, could not be heard. In 58 out of the 67 ears with subjective noises there was an immediate improvement after the first application of the massage, which, however, disappeared in several minutes. The noises returned in a great number of cases with the previous intensity and also the improvement in hearing was lost again. The latter showed a permanent improvement only in 4 ears out of 81; in 19 out of 69 there was diminution of noises, which was more favorable. The cases did not warrant a favorable prognosis if the first application of the massage was followed by improvement only; an unfavorable prognosis was given when the improvement was insignificant.

I treated by massage 27 cases, 8 one-sided and 19 double-sided, on the whole 46 auditory organs affected with **simple chronic middle-ear catarrh**, in particular its hypertrophic form, characterized by swelling and thickening of the mucous membrane and its sequelæ, the so-called adhesive

catarrhal processes (Politzer), in the tympanic cavity; the otoscope showed more or less intense dulness and retraction of the drumhead. In 19 patients the cause was nasal and pharyngeal catarrh. In general the results of massage in this group of cases were better than in the sclerosing processes, particularly as to the acuteness of hearing. In sclerosis only 4 out of 81 (4.9 per cent.) showed permanent improvement. Out of 46 (39.1 per cent.) cases of simple chronic middle-ear catarrh, 18 showed a permanent improvement in acuteness of hearing. Subjective noises were permanently improved in 19 out of 67 (28.3 per cent.) cases and 16 out of 35 (45.6 per cent.) in simple chronic middle-ear catarrh.¹

Encouraged by the not unfavorable results that were obtained in simple chronic otitis media, I have used this procedure also in **subacute middle-ear catarrh**, in which stupor is not rarely an essential symptom, besides tinnitus and hardness of hearing. Cases of serous exudation in the drum were not treated by massage, as they yielded readily to inflation, with or without paracentesis of the drum. 27 subacute cases, 18 one-sided and 9 double-sided, were treated by massage with the following results: Permanent improvement of the tinnitus and acuteness of hearing occurred in 16 (44.4 per cent.) ears; in 7 (19.4 per cent.) permanent improvement was obtained by combined treatment with massage and inflation after previous inflation alone, or massage alone, had been tried without notable effect. In 13 (36.1 per cent.) no permanent result was obtained.

Further, I beg to report the results in some cases of **influenza complicated with acute simple or purulent middle-ear inflammations** that had run their course. In 6 out of 11 ears the final result was a very great diminution, or complete cessation, of subjective noises, and in 6 out of 9 an essential improvement of the acuteness of hearing. In 6 patients, all women, who had had influenza aggravated by an otitis media, leaving disturbances in the sound-perceptive apparatus, massage treatment was applied

¹ The author illustrates the improvement of this and other groups by reports of typical cases which, in the translation, have been omitted.

with the following ultimate results: in only 2 was the tinnitus improved during the time of treatment but it returned afterwards.

Of particular interest were the results of massage in the sequelæ of chronic middle-ear suppuration—*i. e.*, dry perforations, cicatrices, adhesions. Massage was used in 26 cases, 16 one-sided and 10 double-sided. The results showed improvement of the subjective noises, which as is usual in this condition were not very intense, in 22 out of 24 affected ears. There was improvement of hearing in 16 out of 36 ears. There was improvement in both tinnitus and hardness of hearing in only 18 ears (50 per cent.).

To conclude, I desire to mention that I treated for the sake of experiment **cases** with pneumo-massage **in a certain number of which a sure diagnosis of the seat of the affection could not be made, and in another number of which an idiopathic affection of the sound-perceptive apparatus could be assumed.** Of the latter (12 patients with 21 diseased ears) massage showed an improvement only in one double-sided case in so far as the subjective noises abated during the course of treatment but returned more strongly so soon as the treatment was discontinued. In all other cases the results of massage as to tinnitus and the acuteness of hearing was completely negative, and the treatment was, therefore, omitted after several trials. As to the cases in which a sure diagnosis of the seat of the disease could be made out (22 patients, 8 one-sided and 14 double-sided) the results of the massage treatment were as follows: Vertiginous symptoms, present in 2 cases, were permanently cured. Sharpness of hearing showed an improvement only in 1 case. In 3 cases the massage was completely ineffectual.

Briefly stated, **the results of my observations were as follows:** Among 43 cases of sclerosis of the middle ear an improvement in hearing was obtained in only 4.9 per cent. of the cases in which the impairment of hearing had not yet reached a high degree, whereas, a permanent cure of the subjective noises occurred in 28.3 per cent. Essentially better were the conditions in simple chronic middle-ear

catarrh ; 39.1 per cent. showed a permanent improvement in hearing, and 45.7 per cent. showed an improvement in the subjective noises. Similar results were obtained in subacute middle-ear catarrh,—*i. e.*, permanent improvement of both hardness of hearing and tinnitus in 44.4 per cent. Still more favorable were the results in cases of influenza, or cases which had recently recovered from an acute influenza middle-ear inflammation ; 54.5 per cent. showed an improvement of the subjective noises, and 66.6 per cent. of the acuteness of hearing. Still more gratifying was the massage in the group of cases which showed the sequelæ of chronic suppuration of the middle ear ; in 91.6 per cent. there was either complete recovery or notable improvement in the subjective noises and unpleasant sensations, whereas the hearing power was essentially improved in only 55 per cent. In those cases where a precise diagnosis could not be made the results of the massage treatment were sufficiently good to justify further trial.

Based on the above reported experiences I may express my opinion as to the therapeutic value of the vibratory massage as follows : This treatment has showed itself a valuable adjunct in certain affections of the middle ear and deserves to be tried, especially when the hitherto customary methods of treatment have proved inefficient. Further I should say that the vibratory massage does very little good in that form of chronic hardness of hearing for which it has been particularly recommended, namely, sclerosis of the sound-conducting apparatus. Above all I would recommend the trial of pneumo-massage in patients suffering from subjective noises to such a degree as to render them unable to attend to their business. Vibratory massage is further to be recommended in cases of simple chronic hypertrophic middle-ear catarrh with dulness and retraction of the drumhead, and likewise in subacute middle-ear catarrh, in acute otitis media caused by influenza, and the sequelæ of chronic purulent otitis media where by customary treatment an improvement of the subjective noises and the power of hearing could not be obtained. In these cases particularly massage shows itself to be of essential value. It

is justifiable to try massage in those cases in which a certain diagnosis could not be made as in them the subjective noises were improved in 40 per cent., and improvement in hearing in 5.7 per cent.

In conclusion I want to repeat my former statement, that in pronounced cases of idiopathic affections of the sound-perceptive apparatus massage, so far as my experience goes, promises no results whatever.

ON OTOGENOUS MENINGITIS.¹

BY DR. JACOB COHN, OF BRESLAU.

Translated by Dr. H. KNAPP.

IN comparison with intracranial complications of inflammatory middle-ear processes, meningitis has, of late, relatively seldom received special attention. The interest of clinicians centres chiefly in those complications of middle-ear inflammation whose curability has been more satisfactory, namely, cerebral abscess and sinus thrombosis. A comprehensive picture of otogenous meningitis has not yet been presented.

Otogenous meningitis mostly follows chronic suppurations in the cavities of the middle ear through direct contact of the diseased portion of the temporal bone with the cerebral meninges, either with or without perforation of the dura. This origin of meningitis is, however, not directly proven when at autopsy we find caries and necrosis of the tegmen tympani with involvement of the dura, for a perforation of the dura may be closed by adhesive inflammation between the dura and pia, and further search will discover that the path of infection leads through the labyrinth. According to our experience, the propagation through the labyrinth is the more frequent either after destruction of the fenestral membranes, perforation of the semi-circular canals by cholesteatoma, carious processes, or by extension of the pyogenic germs along the nerves, aqueducts, and veins into the arachnoid cavity. The labyrinth may be completely shut off from

¹ From the Department for Ear, Nose, and Throat Diseases, in the Hospital of All Saints at Breslau (Dr. Brieger, Executive Surgeon).

the middle ear and nevertheless transmit the infectious agent to the meninges. On the other hand in many cases the chronic suppuration slowly causes the formation of adhesions which, for a long time, may prevent the entrance of the suppuration into the arachnoid cavity.

It is rare that other preformed channels are followed. Ordinarily the petrosquamous suture in the roof of the tympanum is mentioned among the passageways of tympanic suppuration to the meninges. It is, however, sure that meningitis occurring in the age in which this fissure is present, namely, in the first half-year of life, is so very rare that the propagation of suppuration through this fissure can scarcely be considered. Just as little can we accuse physiological dehiscences as favorable paths for extension of tympanic suppuration.

Another channel in which suppuration can travel from the ear into the brain is the canal of the facial nerve. This possibility should be continually borne in mind, a fact which I beg to exemplify by a case from our own hospital practice.

CASE I.—Acute purulent otitis media with mastoid involvement. A sequestrum of carious bone of the wall of the facial canal opened the way for the invasion of the meninges. Duration of the disease, seventy-six days. Autopsy.

Mrs. M., fifty-five years old, presented herself with acute left otitis media and strong involvement of the mastoid process. By antiphlogistic treatment and repeated paracentesis of the drum membrane, she felt relieved at the beginning. After prolonged treatment she stayed away for four weeks. During that time she had intense headaches and lost strength. The otorrhœa continued. At her return she said that four weeks after the beginning of our treatment the disease "had gone into her head." She had opisthotonos, vertigo, fever, and nystagmus when looking to the right.

September 23d.—Great emaciation, temperature 38° C., head freely movable without pain. Horizontal nystagmus while looking forcibly to the right. No other nervous symptoms. Background of eyes normal. Right ear: drumhead dull, grayish-white. Left ear: mastoid process greatly swollen, sensitive to pressure at its base and tip. Region of the mastoid emissary slightly swollen and tender. External meatus filled with creamy, inoffensive pus which,

after complete cleansing, reappears quickly. Through the perforation in the lower part of the tympanic membrane swollen mucous membrane protrudes.

September 25th.—Upper and posterior membranous walls distinctly bulging.

Opening of the mastoid.—On the first stroke of the chisel a large quantity of creamy pus escapes. All the cells down to the tip are opened. The whole process is converted into a uniform cavity. Upon opening the antrum a perforation at the roof is noticed. Granulations cover the dura of the middle cranial fossa. Suspecting the presence of an extradural abscess or sinus thrombosis in the posterior cranial fossa, the latter is opened, but is found to be free from abnormalities.

Oct. 2d.—First change of dressing; the wound in good condition. In the further course of the disease a facial paralysis developed which, at the beginning, was scarcely perceptible, but total from October 14th on. The left ear was completely dry. The tympanic membrane is difficult to recognize; it is apparently bulging. Exploratory paracentesis elicits only blood. The retro-auricular wound in full healing process.

Oct. 22d.—Patient complains of stupor, is depressed, and cries without any cause. No other psychical symptoms. Next day, frontal and occipital headache, nausea, tremulousness, and staggering. In the evening, chills, temperature up to 39° C., patient difficult to arouse, answers slowly but correctly. She is mostly dozing. Patellar reflexes exaggerated. Suspecting the presence of a latent cerebral abscess, or the diffusion of a formerly circumscribed meningitis, a lumbar puncture is made with negative result. Under a general anæsthetic the wound is reopened and the antrum broadly exposed also towards the tympanic cavity. In doing so a sequestrum, 1.5 mm x 2.5 mm, is found in the medial wall of the passageway from the antrum to the attic and is removed. Then the sigmoid sinus is exposed again, its walls being covered with granulations and thickened. An exploratory opening has negative results.

Oct. 23d.—Greater somnolence. Movements of the head painful. Patellar reflexes, left greatly exaggerated, right strong, ankle clonus. Pulse and respiration accelerated.

Oct. 24th.—Pulse scarcely to be felt. Patient constantly in passive decubitus. Background of eyes normal.

Oct. 25th.—Death.

Autopsy.—The dura tight. The sulci of the whole convexity of the brain are filled with a more or less thick layer of pus arranged around the veins of the pia mater. The same condition, but in less degree, is found at the base of the brain. Cerebral substance normal. Ventricles not notably enlarged. Cerebro-spinal fluid muddy; in the left lateral ventricle, purulent fluid. No thrombi in the sinuses. In the posterior cranial fossa, near the left lateral sinus, a defect in the bone the size of a pea, closed only by membrane, leads into the opening made by the operation. Above this place the bone is superficially eroded in an area 2.5 *cm* in diameter. A probe penetrates into softened and discolored osseous substance in which a complete separation of bone can nowhere be found. In the internal auditory canal purulent secretion around the facial and auditory nerves. Temporal bone: all of the compartments of the middle-ear converted into one uniform cavity; the defect at the roof of the tympanum is noted; the dura is covered with granulations; the facial is exposed through the dehiscence of its external wall.

Remarks.—The cause of the meningitis was a small piece of necrosed bone in the facial canal at the aditus ad antrum; its removal opened a channel for the propagation of the pyogenic germs to the meninges.

Very rare, but authentically observed, is the propagation of suppuration through the carotid canal. The most careful search in the records of the pathology of the ear may fail to suggest a clue to the pathway by which the suppuration has crept into the arachnoid cavity, a pathway which the most careful autopsy may fail to detect. We have to fall back to extension along the blood or lymph vessels and the nerves. A recent case from our hospital department may serve as an example of this mode of propagation.

CASE 2.—Acute otitis media; persistent headache after paracentesis. On 10th day, first symptoms of meningitis; death on the eleventh. Duration of disease, eleven days. Autopsy: purulent meningitis.

Patient had acute otitis media without any peculiar features in its course apart from the headache persisting after the paracentesis. On the 10th day the first symptoms of meningitis suddenly appeared. Twenty-four hours later, death. The autopsy demonstrated extensive purulent meningitis. Examination of the

temporal bone showed no abnormality apart from the inflammatory changes found in the mucous membrane of the middle-ear cavities except a collection of pus in the cells immediately below the tegmen tympani. The labyrinth was free.

According to Koerner, otogenous leptomeningitis from purulent inflammation of the middle ear is mostly produced by an unperforated resistant tympanic membrane. This statement is supported by several observations.

Traumatism may produce meningitis otogenously, even when the tympanic cavity is free from inflammatory symptoms. In general the drum is germless; occasionally, however, it contains micro-organisms, which probably have entered through the tube. These organisms may remain indefinitely quiet, but by traumatism, with hemorrhages into the drum, they may become virulent and infect with the drum the subarachnoid cavity, as was exemplified by a case reported by Brieger. If this can occur with an intact middle ear, it may do so much easier when the cranial cavity is in communication with the drum. The knowledge of the anatomical localization of the meningitis is of importance to account for the variety of its clinical picture. It has been customary to consider the base of the brain as always being affected; without doubt, this is so in the majority of cases. The observation of disconnected foci of suppuration, found in autopsies, may be explained by the results of lumbar puncture, which show that the suppuration may extend through the whole arachnoid sac. Whether such a discontinuous expansion of meningitis is caused by low virulence of the pyogenic substances, as S. Wolf supposes, is questionable. In our hospital we meet at times with cases of very low chronic suppuration, with relatively slight virulence of the germs, but followed by grave diffuse meningitides.

A very remarkable microscopical examination of the suppuration has been observed by Swain,¹ namely, the location of the suppuration in the **choroid plexus**, resulting from caries

¹ Four cases of otitis media purulenta with extension into the skull and the back of the neck. ARCH. OF OTOL., xxvi., p. 39, 1897; *Zeitsch. f. Ohr.*, 1897, Bd. 31.

of the roof of the drum, without having produced suppuration in the meninges. Involvement of the plexus in diffuse meningitis is frequent. Swain's case of isolated affection of the plexus, which was perhaps only apparent, is unique. The extension to the spinal part of the arachnoid sac is, especially in meningitis of the posterior cranial fossa, mostly macroscopically recognizable. According to Lichtheim, there are no pure cerebral or pure spinal meningitides. The communication of the subarachnoidal spaces makes the transportation of the infectious substance into the cerebro-spinal system a necessity. Occasionally otogenous meningitis is found isolated in the spinal arachnoid sac. In this case the affection in the cerebral part may be slight and circumscribed; whereas in the spinal part it may be developed with great intensity. Spinal meningitis will terminate only after its extension to the cerebrum. A conclusive example of the slow course of spinal meningitis is the following:

CASE 3.—*Otorrhœa* from childhood, fourteen years. Aggravations and remissions, with symptoms of cerebral involvement, simulating hysteria. A number of extensive ear and head operations in several hospitals with negative result, but always followed by temporary relief. Death from cerebro-spinal meningitis. Duration of disease, seventeen years.

Mr. M., nineteen years old, suffered from ear disease since childhood. He was during the last three years almost constantly under treatment. He complained of pain in the head and back; he had at times fever, with repeated chills and occasionally disturbance of consciousness. During this time he was treated in twelve hospitals, mostly surgically. When he presented himself in Breslau he was feeble, pale, depressed, and timid. His temperament was very changeable, maniacal at times and melancholic at others. He lay in bed, apathetic, and soon after complained of great pain in his back. Behind the right ear there was a granulating wound, 5 *cm* in length. The probe penetrated 2 *cm* inward, evidently into the antrum. Fetid pus was in the ear. The infiltration of the walls of the meatus prevented the recognition of details. His temperature remained permanently at 39° C., pulse 75. To avoid errors from the simulation of hysteria the temperature was taken in the rectum and was found always normal, even at the time when it was considerably elevated in the axilla. Upon inquiry at the hospitals where, on account of

diffuse cerebral symptoms, operations for sinus thrombosis and cerebral abscess had been made, we were informed that none of those diseases were ever found. All those operations, however, had been followed by conspicuous improvement, which seemed to confirm our suspicions of the presence of hysteria. In some places the patient had been dismissed on account of disobedience. The local symptoms of the ear and mastoid wound necessitated the exposure of the whole field of operation. After the removal of the granulations the dura and the posterior cranial fossa were freely laid bare. There was distinct pulsation over the dura and also of that of the middle cranial fossa, which made the presence of a cerebral abscess rather improbable. The operation was concluded by an exposure of all the middle-ear cavities. After this operation there was again a remarkable improvement in the condition of the patient. He stated that he scarcely felt pain in his back and head, but that his mental condition was so unsteady that it caused him a great deal of annoyance. In two weeks the spinal pain returned and the patient took permanently to his bed. Not a long while after, the patient complained of intense headache for several hours, became unconscious, and showed the characteristic picture of meningitis. The temperature was, shortly before the onset of the disturbance of consciousness, raised to 40° C. About twenty hours later he died.

Autopsy.—*Cerebro-spinal meningitis from suppuration of the middle ear.* No changes were found in the middle fossæ but the posterior cerebellum was covered with pus. Putrid masses were found most densely in the region of the entrance of the facial and acoustic nerves into the right petrous bone. Meningitis was demonstrable through the whole spinal canal, where it had led to great thickening of the soft meninges. Temporal bone: granulations in several places on the surfaces of the middle-ear cavities; fenestræ, normal; stapes, imbedded in granulations; labyrinth, filled with pus.

Remarks.—The differences between the lesions of spinal and cerebral meningitis support the supposition that the spinal process was of an earlier date. It is quite possible that several attacks ran their course, one after the other, at longer or shorter intervals. It is possible, however, that the adhesions between the dura and pia, found post-mortem in the anterior cranial cavity, have to be referred to previous

processes in the cerebral meninges that had run their course. The latency of the spinal meningitis is not surprising if we bear in mind how frequently even cerebral meningitis finishes its course without any symptom. The cerebral phenomena accompanying the successive attacks may not have been produced by aggravations of meningitis, but may have been the expression of inflammatory œdema in certain parts of the arachnoidal sac causing increased transudation of liquor, showing the picture of the disease described under the name "serous meningitis." The different operations accompanied by opening the cranial cavity may have given relief through diminishing the œdema by depletion. The case is an example of the difficulty encountered in making a clinical diagnosis on account of the frequent latency of meningitis. The peculiar psychical alterations led to the error in diagnosis. In other cases similar symptoms may be referred to tangible changes that afterwards will not be found. The variety of the causes of meningitis has been pointed out by earlier authors. The apoplectic type is met with in such otogenous meningitides which are brought about by perforation of a cerebral abscess into the lateral ventricles, or on the surface of the brain. The same course may be noted if uncomplicated pure meningitis follows the acute infections of the tympanic cavity. The following case of otogenous meningitis may serve as a type of this most acute course:

CASE 4.—Fulminant meningitis from influenza otitis. Pachymeningitis from contact with perforated dura over tegmen tympani, and meningitis propagated through the labyrinth.

Mr. S. presented himself with acute otitis media dextra following influenza. The great sensibility to pressure over the mastoid region, accompanied with copious suppuration and an intense involvement of the mastoid mucous membrane, did not yield to antiphlogistic treatment. Constant and permanent right-sided headache, exacerbating at night; the further permanent rise of temperature demanded opening of the mastoid. The temperature lower and the headache completely removed. The secretion from the drum disappeared rapidly. The patient was discharged from further treatment. Sometime after the opening of the mastoid intense headache set in suddenly at noon; in the evening

the patient was completely unconscious. When he returned in an ambulance the next morning he showed the picture of pronounced meningitis. Lumbar puncture discovered a great deal of albumin, the presence of an immense quantity of pus corpuscles, besides disseminated cocci and bacilli, resembling those of influenza. About twenty hours after the onset of the severe symptoms, death.

The **autopsy** demonstrated *extended virulent meningitis propagated through the internal auditory meatus*. The fresh exudation and the absence of dilatation of the ventricles excludes the longer duration of the inflammatory process which we might suppose to have preceded the acute aggravation. The case shows, also, the remarkable simultaneous occurrence of pachymeningitis from contiguity of the defect in the tegmen tympani and leptomeningitis through propagation of the suppuration through the labyrinth.

Meningitides from chronic middle-ear suppurations have a fulminate course only rarely, namely, when it has been long circumscribed and suddenly becomes generalized.

CASE 5.—Chronic purulent otitis media. Operation made on account of intense headache, but did not relieve it. Recovery from operative wound progressing nicely. Suddenly meningeal symptoms. Death in twenty hours. **Autopsy:** Diffuse meningitis, origin and propagation not traceable.

Only a short time ago a case was observed at our department in which on account of carious processes in the bony walls of the middle-ear cavities, an operation was performed. Intense headache was the immediate cause of the operation but it was not relieved by it. As other symptoms of the propagation of suppuration through the labyrinth and cranial cavity were missing no further interference was resorted to. The recovery from the operative wound progressed nicely. On a sudden meningeal manifestations appeared which ended in death, in the course of twenty hours. The temperature up to the onset of these phenomena had been normal. The autopsy discovered an intact labyrinth and normal osseous surroundings of the middle-ear spaces, and a diffuse meningitis the propagation of which from the ear was doubtless but not exactly traceable.

Just as variable as the course is the picture of disease of otogenous meningitis in its terminal stage, which almost

always corresponds to the onset of generalization. Pathognomonic symptoms scarcely ever fail. At the beginning fever is present and at times the well-known pyæmic temperature chart of sinus thrombosis. Retardation of the pulse as an expression of intracranial tension mostly is not very marked. Changes in the background of the eye are at least as often absent as present. Irritation phenomena are most pronounced in the contra-lateral extremities because the hemisphere on the side of the diseased ear is usually most affected. Focal symptoms are frequently noticed at the beginning of meningitis. Aphasic disturbances have been described. Jansen reports a case of optic aphasia which he diagnosed as due to circumscribed meningitis on the lower surface of the temporal lobe and which was cured by opening the skull. Such symptoms need not always be caused by circumscribed meningitis with inflammation of the adjacent cortical zone of the brain, but only by a temporary suspension of function from transient œdematous infiltration. Cases in support of this statement are on record.

Errors of diagnosis between transient œdema, meningitis, and abscess will continue to be made. Not only all symptoms of destruction or irritation but cerebral symptoms in general may be present in otogenous meningitis. In some cases disturbances of general health are prevailing and not infrequently mislead us to confound meningitis with typhoid fever. Lumbar puncture may clear up the diagnosis. Opisthotonos is present not only in meningitis but may be so in all inflammatory processes in the posterior cranial fossa, *e.g.*, cerebellar abscess and extradural accumulation of pus. Still more indefinite are the symptoms of spinal meningitis. Its occurrence in otorrhœa is demonstrated by observations of Abercrombie, Lichtheim, Jansen, and others. Oppenheim details the symptoms of pure spinal meningitis as follows :

“Rigidity of the muscles of the trunk and extremities with great exaggeration of the mechanical muscular excitability and tendon phenomena (exaggeration of the knee jerk and foot tremulousness), hyperæsthesia of the skin and soft parts at the trunk and extremities, back phenomena

(inward curvature of the vertebral column on pressure and beating of the back), disturbance of the function of the bladder and rectum, girdle-pains, and finally paraplegia and loss of the knee jerk."

Considering what has been said, it is evident that the clinical diagnosis of otogenous meningitis is often impossible. Lumbar puncture is the only means of recognizing it distinctly. The diagnosis is sure if lumbar puncture demonstrates, by microscopic and chemical examinations, pus in the cerebro-spinal fluid. The culture experiments are less reliable for they may be negative in undoubtable cases of meningitis. Lumbar puncture will furnish the proof that cases of true meningitis may be recovered from. The curability of circumscribed meningitis is established by several observers in which the autopsy *in vivo*, the operation, demonstrated the presence of circumscribed foci of the pia mater. If otogenous meningitis is only apparently diffuse, a collateral œdema, producing the symptoms of general meningitis, will of course disappear by the elimination of the circumscribed suppuration in the arachnoidal sac. Perhaps the number of observations of meningitis serosa in ear disease may be explained in the same manner. An example in point may be reported :

CASE 6.—Epidural abscess evacuated by mastoid operation. Transient relief. Marked cerebral symptoms. Reopening of the wound. Dural flap. Two punctures of the brain, no pus, but abundant discharge of cerebral fluid. Permanent recovery.

A girl of eighteen years, of healthy family, without previous disease, was taken with hoarseness and pain in the throat two weeks before admission. She suffered from a peculiar whitish coating of the pharyngeal tonsil which disappeared in two days, probably angina of the pharyngeal tonsil. Then furunculosis of the right, and soon after of the left, ear set in. Subsequent otitis media necessitated paracentesis of both drumheads. Left ear: meatal walls red, swollen, covered with dry secretion; mastoid tender on pressure; posterior half of the drumhead very red and bulging. Right ear: The drumhead was red, bulging, and perforated; otorrhœa. The left ear gradually improves; the right continues to discharge pus and to be tender on pressure over the

mastoid. Aggravation of the symptoms with intense headache demanded the **opening of the right mastoid process**. The antrum was very small, the mastoid process but little developed, and an extensive extradural collection of pus was found in the middle cranial fossa communicating with the middle ear through a defect in the roof of the antrum. The patient improved, was discharged from the hospital to be treated as an out-patient. She had, however, soon to be readmitted on account of the presence of fever and increase of headache. A gradual paralysis of the right external rectus, slight stiffness of the neck, and a rapidly increasing optic neuritis made their appearance. Her mental faculties were disturbed. A rapidly progressing acute encephalitis seemed to be the most probable diagnosis. The **operation wound was**, therefore, **reopened**, the dura broadly exposed, and a dural flap from the middle fossa was laid back, the brain punctured, and, as this gave negative results, two exploratory incisions were made. The cerebral fluid escaped abundantly. The cerebral substance on section appeared somewhat œdematous. After the operation her mental faculties were soon restored, the temperature sank from 39.6°C to 37°C in several hours, and remained there. The wound behind the ear gradually closed. The drumhead had a right perforation in the posterior lower quadrant. Paralysis of the right abducens persisted. She occasionally had headache; no fever; pulse irregular from 100 to 108; general condition good; changes in the background of the eyes gradually disappeared; more slowly the paralysis of the abducens. The duration of the disease was three months.

Diffuse meningitis has, from the first, been considered incurable. In opposition to this belief are chiefly the observations of Macewen, who had six recoveries in twelve cases operated upon for meningitis. Unfortunately these cases are not reported in detail, and no lumbar puncture was made, so that it is not certain whether he had to deal with pure diffuse meningitis. In a case of Brieger's, which will be published later at another place, the recovery was unquestionably demonstrated. Recovery was obtained by the stamping out of the pus focus in the middle and inner ears after lumbar puncture had established the presence of meningitis. Lumbar puncture, which has been made in our hospital in all cases of supposed meningitis, almost invariably

was followed by the relief of the patients. It is without danger. Recoveries of such otogenous meningitides will, after all, always be exceptional. Therefore we can only repeat the general dictum, prophylaxis against extension of otitis to the meninges is the most important measure. Even to-day it is not out of place to reiterate the self-evident rule that every case of otorrhœa should be cured either by conservative or operative treatment. I should not, however, omit to mention that it is not possible in every case to attain this object.

RETROPHARYNGEAL ABSCESSSES AFTER OTITIS MEDIA PURULENTA.

BY DR. GEORGE KIEN, STRASSBURG.

Translated and Abridged¹ by Dr. J. A. SPALDING, Portland, Me.

WHILST gravitation abscesses in the neck from otitis media are not uncommon, retropharyngeal abscesses from the same cause are rarities in practice.² Having lately seen four new cases of this affection, I take this occasion to report them in brief, together with some remarks on the origin, symptoms, diagnosis, and treatment. Simple cervical gravitation abscesses, which generally originate simultaneously with the retropharyngeal variety, have been so fully described by De Quervain³ that I need not mention them in this paper.

CASE I.—Sophie S., æt. forty-seven, October 15, 1896. Acute otitis externa in left ear with a small peritonsillar abscess and a history of forty years of otorrhœa. *Mt* invisible from contraction of the meatus. Boroglyceride and Priessnitz fomentations into the ear and about the neck. The abscess on the left pharyngeal wall was evacuated, but the patient soon returned with abundant discharge from the ear and a large fluctuating abscess gravitating half-way down the neck. Pressure caused pus to well from the ear. Mastoid swollen, infiltrated, and painful; dysphagia, headache, sleeplessness, and feverishness. Mucosa of pharynx, left tonsil, and uvula swollen and red. Pressure on left pharyngeal wall drives pus from the left meatus.

¹ From vol. xxxix., p. 73, 1901, Germ. Ed.

² In the entire series of these ARCHIVES, for instance, I have found but one case, and that reported by H. Knapp, vol. xxiv., p. 121. See also two cases by Marton and Melzi, *Annals of Otology*, vol. ix., pp. 216, 217.—TRANS.

³ *Semaine médicale.*, 1897, p. 133.

Operation, Oct. 20th.—Nothing abnormal in upper part of mastoid, but the tip carious, and had to be removed. Then the radical operation. Granulations abundant. From the necrotic tendon of the sterno-cleido-mastoid, extends downward a large cavity filled with pus and necrosed tissue, and reaches the border of the trapezius, where a counter-opening was made from the outside. Furthermore, this cavity communicated broadly, internally, with the abscess on the inner pharyngeal wall. Palpation showed nothing but mucous membrane between this and the pharynx wall. The cavity was evacuated, scraped, and filled with iodoform gauze. Complete left facial paralysis at once ensued, with high temperature and rapid pulse, anæmia, and profuse perspiration.

A week later putrid bronchitis came on with crepitation and râles and lasted several days. No secretion followed thoracic puncture. Dressings of the abscess were changed daily and much purulent secretion was removed. By the middle of November slight putrid bronchitis, with crepitation and dulness high up in the thorax. The abscess-secretion daily diminished, and drainage from the cervical incision was omitted. Patient was discharged in December, reporting occasionally for change of dressing. The left facial paralysis remained permanent; the abscess cavity finally granulated and closed so that an ultimate cure was reached at the end of one year of treatment. The walls of the meatus seemed totally adherent to one another.

CASE 2.—Karl D., æt. twenty, suffered for three days with discharge and pain and deafness in A D. A physician had syringed a large amount of cerumen from this ear a few days before.

Aug. 20th.—Small perforation in A D, and abundant suppuration. This ceased rapidly after carbolated glycerine, but he returned Sept. 8th with bulging of *Mt*; profuse suppuration, and mastoid symptoms. Sept. 11th, the mastoid was opened, moderate pus discovered and granulations. Iodoform gauze. Three days later temperature was 38° C. (100° F.), and he complained of pain in the joints, particularly in the right hip. He improved slowly till about Sept. 30th, when infiltration came on in the mastoid incision, pain in the right cervical region, dysphagia, and temperature so high that a second operation was done. The mastoid cavity was enlarged, granulations scraped, and apparently solid bone chiselled away towards the occiput. The sinus was laid open to view, and as its wall looked discolored though pulsat-

ing, puncture was made, letting off only blood. Then the sinus was split open more widely, a step followed by profuse hemorrhage but no signs of thrombus. Iodoform tampon.

A second profuse hemorrhage occurred a few days later when changing the dressing; the temperature still remained very high, dysphagia came on and persisted, the right and posterior pharyngeal walls were much protruded, and an incision as deep as possible in this region let off pus, so that the dysphagia ceased the same day. Before the end of a week the entire condition of the sinus, antrum, and pharynx improved progressively, although the region over the sterno-cleido-mastoid was still tender, and the night temperature slightly elevated.

Dysphagia reappeared in October, with high temperature and pain, but after reopening the abscess cavity, as before, pus once more escaped. After this the patient made a rapid and uninterrupted recovery.

CASE 3.—Augusta, æt. fifty-six, had suffered for several months from influenza-pains in A D, for two months with deafness, tinnitus, and occasional vomiting without fever.

March 11, 1900.—Small cicatrix in left *Mt*. Right ear: narrow meatus, infiltration in *Mt*, no pressure-pain over tip of mastoid, but pain over the base. A S, whisper. A D, profound deafness T-F tests show loss of perception for c 32, c 64, and C in A D, but all tests perfect in A S. Weber right. Schwabach right + 4. Venous congestion of retina O D. The case was diagnosticated as perisinuous abscess.

March 15th.—The operation revealed normal bone down to antrum, but from there abundant pus escaped under pressure. The antrum was enlarged as much as possible, and the sinus exposed for $\frac{1}{2}$ cm., but no granulations or pus discovered.

Up to March 18th no fever or pain, but that night sudden pain in the neck, dysphagia, hard, painful infiltration on the outer surface of right neck, and internally on the lateral pharyngeal wall and in the right tonsil. Slight trismus. Late at night the patient evacuated blood and pus from the throat with great relief to the dysphagia. On the next day pus was seen at the floor of the antrum, and pressure upon the infiltrated surface in the neck caused more to well up. A second operation was now done in which the tip and entire lower portion of the mastoid were removed. Beneath the horizontal sinus we reached a large cavity containing pus and granulations and extending downward like a deep pocket as far

as the mucosa of the pharynx. This was enlarged, scraped, and packed with iodoform gauze. Nothing interrupted from this time on a complete recovery.

CASE 4.—Wilhelmina æt. eight. Nov. 11, 1897. Paracentesis of *Mt*, A S, for acute otitis media. This was followed by high fever, trismus, dysphagia, and pain in the neck. Owing to the trismus, examination of the pharynx was difficult, but there was no doubt of redness and swelling of left pharyngeal wall. Spontaneous evacuation the same night of a mouthful of blood and pus. The left tonsil showed the next morning a cavity from which the pus had escaped. The trismus, soon improved, but mastoid symptoms demanded an operation on the antrum, which was found full of pus and granulations. At the bottom of the antrum was a fistula from which pus escaped on pressure below, and on following this we reached a pocket extending down to the pharyngeal mucosa. Pressure on the left pharyngeal wall through the mouth caused pus to ooze from the antral fistula. The fistula was enlarged, the pus pocket scraped and tamponed as usual. Recovery soon followed.

A brief review of these cases shows in Case 1 a *chronic middle-ear suppuration* lately growing worse, profuse discharge from A S, and an abscess extending from the insertion of the sterno-cleido to the middle of the neck. The entire pharynx was bulged forward. *Pressure there as well as on the abscess in the neck extruded pus from the ear.* The abscess was opened, and a broad communication established between it and that in the pharynx. Six days later *purulent pneumonia* set in but gradually disappeared.

Case 2 was one of *acute purulent otitis* A D, with profuse suppuration, and *pain in the mastoid.* Operation. Four days later *the temperature rose* and remained high for ten days, when dysphagia was complained of. The temperature remaining high, we suspected sinus thrombosis and *split the discolored sinus*, an operation followed with profuse hemorrhage. Nevertheless, the fever remained high and pain in the right cervical region continued. Eight days later *the pharynx bulged excessively*; in a short time an abscess pointed, was opened, and the patient was soon cured.

Case 3 was a *subacute purulent otitis with a perisinuous abscess.* The sinus was exposed. There was no pus in the

antrum, but some escaped from the posterior cranial fossa. Three days later there were symptoms of *retropharyngeal abscess*: moderate fever, bulging of the pharyngeal wall, dysphagia, and painful infiltration in the neck. *Pressure on this region drove much pus from the bony cavity.* The second operation consisted in removing the entire tip of the mastoid. Below this we reached a pus pocket extending beneath the pharyngeal mucosa, opened and cleansed it, and cure was gradually complete.

Case 4 offers the picture of *acute otitis media purulenta* with all the symptoms of retropharyngeal abscess, the antrum was filled with pus and granulations, and a *fistula* reached down from the antrum to the pharyngeal mucosa. In this case too recovery was finally obtained.

The *cause* of these retropharyngeal abscesses was purulent otitis. Formerly, such abscesses were supposed to depend on injuries of the pharynx and œsophagus, when inflammatory irritating agents penetrated the space, filled with loose connective tissue, which spreads out between the spinal column and the pharynx. This region is consequently of great importance, reaching from the base of the skull to the thorax. At the level of the cricoid cartilage it is more narrow and surrounds the œsophagus. In front it is well enclosed on every side, but below, near the inferior thyroid artery, a communication exists with the thorax. In addition to pharyngeal traumatism we find, as causes of retropharyngeal abscesses, caries of the superior cervical vertebræ, and, in the opinion of Bokai,¹ affections of the retropharyngeal lymphatics, which bring to this district discharges from the palate and pharynx, especially with pus-foci in their neighborhood. Resorption of pus into the lymphatics, and thence into the pharyngeal glands, is plausible, as in a case reported by Weil.²

To such causes we must now add *otitis media suppurativa both acute and chronic*. Bezold,³ is inclined to include only the acute form in the ætiology of these abscesses, but my first case proves that an abscess may occur in the chronic

¹ Koenig, *Spec. Chirurgie*, Band i., p. 250.

² "Aetiologie d. Retropharyngealabscesse," *M. f. Ohr.*, 1881, No. 3.

³ *Deutsch. med. Woch.*, 1881, July 9th.

form of otitis purulenta. Schwartz and Hartmann,¹ mention neoplastic bone-formation in chronic otitis, occluding the cells and diploë of the tip and inner wall of the mastoid. Such a condition may account, in their opinion, for *unusual extension* of pus in chronic suppurative otitis.

When pus is once occluded in the middle ear it strives to make its way out, first from the tympanum to the antrum and mastoid cells, which is the easiest way as both have the same mucosa. If occlusion persists, either because the *Mt* is still intact, or because it has closed too rapidly after perforation, or because the perforation is too small or has been closed by granulations, then the pus tries to escape through the bone itself, or along any preformed bony openings. The pus may escape upward through the tegmen, as in Kessell's cases,² and then enter the middle or posterior cranial fossa, from which it can escape through the foramen rotundum or ovale. It may also make an exit from the posterior cranial fossa through the foramen jugulare, extend from there backward to the attachment of the short deep cervical muscles, and forward along the basilar bone of the occiput to the anterior side of the spinal column as far as the level of the epiglottis, where the retropharyngeal space becomes narrow. If such a course is taken, we get paralytic symptoms of the affected nerves in the foramen, as in Kessell's case in which total paralysis of the tongue, dyspnœa, aphonia, and rapid pulse were observed.

The direct paths *downward* are, however, more frequent in the causation of retropharyngeal abscess than the rupture of pus through the tegmen tympani. When it does not so break forth, it can descend through the floor of the antrum, or along the anterior wall of the meatus, avoiding or not the maxillary articulation, or through the posterior antral wall into the posterior cranial fossa and from there downward. Bezold thinks that pus escapes most often from the medial side of the mastoid because the bone is thinnest there.

The paths along which the inflammatory process extends may be partly preformed (vascular channels), partly neoplastic,

¹ Schwartz, *Lehrbuch*, Band ii., p. 328.

² "Otitis Interna. *Inaug. Diss.*, Giessen, 1896.

or they may represent neoplastic perforations from bony absorption. It is generally impossible to decide this point when the communication between the primary and secondary focus has attained any size. This we found so in Cases 3 and 4, in which direct communication with the abscess from the primary bony focus was easily discovered, for pressure on the pharyngeal wall forced pus from the fistula, a sure sign of communication between the retropharyngeal space and the bony cavity.

The occipito-mastoid suture may favor extension of puss especially when, according to De Quervain,¹ the mastoid cells reach as far back as the suture and occiput.

Finally, if the Eustachian tube is occluded, as suggested by Haug,² the pus may escape through the anterior wall of the tympanum, through the peritubal tissues, the canal of the tensor tymp. playing the part of a conductor of infection between the middle ear and pharynx.

The course of the abscess depends on the permeability of the fistula and the amount of pus. In acute cases, it may develop rapidly with fever, trismus, and violent pain in the neck. In chronic otitis the abscess generally forms slowly, increased temperature being long observed without pharyngeal symptoms. These may, however, be so marked from the start that, as in Case 2, we wrongly diagnosed sinus thrombosis. Even after opening the sinus the temperature kept high until the true cause, the abscess, came to light. After the operation the temperature fell. Therefore, our first operation, though not unjustified by the symptoms, was superfluous.

These abscesses generally confine themselves to the space between the spinal column and the pharynx. They rarely descend below the top of the cricoid cartilage because the space is narrow there. It is doubtful if pus escapes into the thorax in the region of the inferior thyroid artery. In three of our cases (2, 3, and 4) the pus collected only in the retropharyngeal space; in the fourth (Case 1) the gravitation abscess lay behind the sterno-cleido-mastoid, arising near its inser-

¹ *Semaine médicale*, 1897, p. 134.

² "Senkungsabscesse," *A. f. Ohrenhlkde.*, 1897.

tion, extending to the trapezius, and reaching the lower half of the neck. The cavity communicated with the abscess on the pharyngeal wall, and pressure upon it drove pus from the ear. This case agrees with others described by Gruber,¹ Rossi,² and Haug,³ only that the abscess gravitated down to the clavicle. If no such excessive extension occurred in my case, it was probably due to the broad communication with the middle ear. Cholewa⁴ says that gravitation abscesses from the middle-ear suppuration may evacuate spontaneously, the pus retreating into the middle ear along its original path, owing to broad communication with the middle ear as well as a large perforation of the *Mt* favoring such an escape.

Case I was interesting from its complication with gangrenous pneumonia, probably from rupture of the abscess into the larynx. Although this could not be proved, it was possible despite scraping of the cavity. For, if the operation did not go deep enough, pus would have remained behind, and later made its escape as suggested.

Such complications have before been observed, for Thiry⁵ describes a retropharyngeal abscess after otitis, in which the autopsy demonstrated death from pulmonary gangrene. A fistula behind the sterno-cleido extended to the clavicle, communicated with the interior of the larynx, and rupture through this had excited putrid bronchitis.

The *diagnosis* of such abscesses is easy so soon as the pharyngeal wall bulges, fluctuates to pressure; when dysphagia is present, and when pressure on the external cervical region causes pus to well up from the meatus. De Rossi was the first to call attention to this latter symptom. The diagnosis is more difficult in the formative state, the abscess coming on with increased temperature alone.

Phlegmonous angina can only be suspected when the tonsils are coated and where general constitutional infection beginning with angina can be established.

¹ "Abscesse i. d. Umgebung. d. Gehoergang," *Oest. Z. f. prakt Heilkde.*

² *Archiv f. Otol.*, xxviii., p. 209.

³ *Archiv f. Ohr.*, xl.

⁴ *Deutsch. med. Wochens.*, "Eiterdurchbruch an auessergewoehnlichen Stellen."

⁵ *Zeitsch. f. Ohrenhlkde.*, xx., p. 77.

Retropharyngeal abscesses may produce serious disturbances. The trismus prevents free opening of the mouth, and swallowing is very difficult, and occasionally impossible, owing to the bulging of the pharyngeal walls. The pain in the neck may be very violent. In severe cases the patient holds his head as far back as possible, because every attempt to bring it forward increases the need for breath. Only in the upright position, with backward bent head, can respiration be freely accomplished.

If retropharyngeal abscesses are not opened or do not evacuate spontaneously, suffocation may follow from compression of the trachea or sudden escape of pus into the larynx.

Gravitation abscesses extending to the mediastinum have been seen in cases treated inefficiently or too late. Koenig thinks that death may ensue despite a proper opening if the abscess lies beneath the cricoid cartilage; in other words, so deep that it cannot be reached by the knife from the inside. With such location, the external incision is imperative. So too, in his opinion,¹ the external opening is indicated in every case of retropharyngeal abscess as the only safe way to avoid infection, which so easily in the case of all pharyngeal wounds complicates and retards discovery. He makes the incision on the outside of the neck on a level with the inferior thyroid artery, if the tumor has gravitated so far, and believes, from Burckhardt's experience, that an external opening is indicated even when the phlegmon has not extended beyond the retropharyngeal space. Open along the inner margin of the sterno-cleido, on a level with the larynx, at the inner side of the thyroid vessels, keeping close to the larynx until we reach the medial side of the carotid, where we come down on the connective tissue of the pharyngeal space. Having made the abscess cavity accessible, we enlarge it with strong forceps, scrape it clean, and plug with iodoform gauze.

Chiene makes the incision along the posterior margin of the sterno-cleido, and enters the abscess cavity from the anterior wall of the spinal column.

¹ *Specielle Chirurgie*, Band i., p. 523.

If a fistula is already present in the pharynx, if the abscess is not too large, if there seems to be the least possibility of working from the mastoid opening without running the risk of excessive gravitation or retention, it is sufficient, as these cases show, to make a broad communication between the abscess and the mastoid opening, and to conduct the after-treatment from this opening.

THROMBO-PHLEBITIS OF THE SUPERIOR LONGITUDINAL SINUS FOLLOWING INFLAMMATION OF THE FRONTAL SINUS.

BY PROFESSOR G. KILLIAN, FREIBURG I. BR.

(With six illustrations on Plates VIII. and IX., *Zeitschrift für Ohrenheilkunde* Vol. XXXVII.)

Translated by Dr. ARNOLD KNAPP, New York.

THE superior longitudinal sinus enters into close relation to both frontal sinuses. Its anterior, narrow extremity extends down to the foramen cœcum (Fig. 1). Zuckerkandl has demonstrated a direct vascular communication between certain areas of the mucous lining of the frontal sinuses and the superior longitudinal sinus. If the latter be injected, the injection enters numerous small, osseous veins and corresponding areas of the lining mucous membrane of the frontal sinuses. Thus inflammations may extend by thrombo-phlebitis from these areas to the superior longitudinal sinus.

Certain published cases have furnished proof of this and demonstrated that the character of a frontal sinusitis with this complication is a peculiar one and one depending upon a particularly virulent infection. In *Heymann's Handbuch* I have described this variety of sinusitis and have given it the name of sinusitis exulcerans atque abscedens.

The symptoms produced by an infection of the superior longitudinal sinus are peculiar and most interesting. To understand them clearly it is necessary to bear in mind the picture of all the venous tributaries of this sinus.

The anterior tributary regions of this venous channel are

situated externally in the mucous membrane of the frontal sinuses and the lateral and median parts of the nasal mucous membrane where the ethmoidal veins originate. Zuckerkandl was the first to describe a vein coming from the anterior, lateral, and superior parts of the nasal mucous membrane (agger nasi) (Fig. 2), which, accompanied by a branch of the anterior ethmoidal artery, enters the cranial cavity through the lamina cribrosa. There it either empties into the venous system of the olfactory tract, or directly into a larger vein of the orbital lobe of the brain (Fig. 3), which joins the superior longitudinal sinus.

Venous blood from the frontal bone communicates with the anterior part of the longitudinal sinus through the frontal diploëtic veins (Fig. 4), which anastomose with the external frontal vein (Fig. 5). This sinus in its farther course collects the blood from the veins which pass over the hemispheres (Fig. 6); in addition a number of veins from the dura mater also join it. Finally it should not be forgotten that there is an opening in the parietal bone by which the superior longitudinal sinus communicates with the veins of the parietal region of the scalp (Fig. 5) through the parietal emissary (Santorini).

A phlebitis may extend from the sinus to any of these veins causing a most complex clinical picture. The clinical material is small; there are only five cases on record, namely: those of CARVER, *British Medical Journal*, 1883, June 16; MACEWEN and MILLER, *Macewen's Pyogenic Diseases of the Brain*; L. MÜLLER, *Wiener klinische Wochenschrift*, 1895, page 194; E. FRAENKEL, *Virchow's Archiv*, vol. cxliii., page 80; and ROTH, *Wiener klinische Wochenschrift*, 1899, No. 14, page 383.

In Fränkel's communication, it is briefly stated that, following chronic purulent sinusitis, a thrombo-phlebitis developed with consecutive pyæmia, which was made clear at autopsy.

Macewen and Miller's case is that of a young girl who became ill and died after a chronic purulent frontal sinusitis, where the left frontal sinus had been operated upon, with the symptoms of severe general infection—remittent fever,

splenic tumor, lung complications, and an abscess of the frontal bone. According to the autopsy report, the cranial walls of the frontal sinus were not carious, nevertheless an extradural abscess was found in the adjoining area, and intradurally there was a purulent membrane on the surface of the brain extending to the median line. The superior longitudinal sinus contained pus. The lateral sinuses were not thrombosed. The left lung contained two wedge-shaped infarcts surrounded by a yellow area of softening, and there were fresh pleuritic changes on the left side. The spleen was enlarged, hyperæmic, and softened.

In this case, a phlebitis of the veins leading to the longitudinal sinus was produced by disease of one or both of the chronically inflamed frontal sinuses. This phlebitis extended to the longitudinal sinus and the veins which join it in its anterior extremity. The extradural abscess presumably originated from involvement of the frontal dural vein, the intradural purulent membrane of the brain was caused by disease of the frontal vein on the surface of the brain, and the subperiosteal abscess on the external surface of the frontal bone is an evidence of the extension of the disease along the frontal diploëtic veins.

In addition to these local changes there were the well-known symptoms of pyæmia and embolism of several branches of the pulmonary artery.

The case of Roth can be explained by very much the same course of deduction. A man, thirty-nine years old, suffered from nasal polypi and continuous frontal headache for three months. The bilateral frontal sinusitis, confirmed at autopsy, must have existed for a long time. A bilateral, slight chronic œdema of the upper eyelid is an evidence of the tendency of an inflammation to extend to the neighboring structures of the sinus. An abscess as large as a hen's egg developed in the middle of the forehead between the two frontal tuberosities. The thrombo-phlebitis of the superior longitudinal sinus must have preceded this and the inflammation extended by means of the frontal diploëtic veins to the frontal vein. The severe cerebral symptoms which led to the patient's death on the fourth day show that the other intra-

cranial changes found at operation and autopsy must have been in full development. An extradural abscess containing 2 cc of pus and communicating by three fine perforations in the frontal bone with the extradural abscess was also the result of involvement of the frontal diploëtic veins. Finally, the bilateral purulent meningitis of the convexity was secondary to an extension of the disease through the superior longitudinal sinus to the superficial cerebral veins.

At the autopsy an area of encephalitis was found in the substance of the frontal lobe on the right side. On the left side there was an abscess. It is interesting to ask whether these conditions were caused by a direct extension of the frontal-sinus affection or secondary to the involvement of the superior longitudinal sinus. I am inclined to the latter view as the cranial walls of the frontal sinus showed no changes. The symmetry and bilateral occurrence of these foci are also very striking. It seems to me that the infection travelled through the superior longitudinal sinus and the vascular communication with the orbital lobe as described by Zuckerkandl. Unfortunately a report of the location of the intracranial focus in the frontal lobe is wanting. It would be well worth while to pay special attention to this relation in future cases.

Thrombo-phlebitis of the longitudinal sinus produces characteristic secondary pathological changes. After these have become clear to us the interpretation of Müller's case presents no difficulties. It is a typical picture of the disease in question. The suppurations in typical localities must have been caused by disease of the superior longitudinal sinus, though the autopsy report does not mention a thrombo-phlebitis of this sinus and the case had been interpreted in a different way by the pathologist.

The patient suffered with an acute influenzal sinusitis of the frontal cavities and an abscess presented over the left parietal bone which was discovered and incised on the thirteenth day; it contained a large quantity of fetid pus and had exposed the bone. On the fifty-eighth day another incision was necessary. A hole was then found in the parietal bone filled with granulations, leading into an extensive

intracranial, extradural purulent cavity limited by thickened and discolored dura. This hole was the parietal foramen, transmitting the emissary vein of Santorini, to which the inflammation had extended from the superior longitudinal sinus. This had probably taken place even before the sixth day of the disease, because at that time a swelling was detected in the region of the ear in connection with the superficial temporal vein (a vein which communicates with this emissary). This swelling led to an abscess which was incised. On the sixth day a swelling of the left frontal region was reported which later covered the entire left half of the skull. It is not stated whether a circumscribed abscess was here formed, so that it is impossible to say definitely if this swelling on the left frontal region was secondary to the longitudinal sinus affection or to the orbital process.

I consider the right-sided meningitis of the convexity which appeared toward the end of the disease, another evidence of the rôle which the thrombo-phlebitis of the superior longitudinal sinus must have played in this case.

From the thirty-fifth day on, we have joined to these local signs, pyæmic appearances in the form of rigors. The sinusitis was complicated at the beginning by inflammatory swelling of the orbital tissue and of the lids which seemed to have been caused by the extension of the disease to the recess in the orbital roof which communicated with the frontal sinus by means of a small opening, as was seen at the time of operation. The opening was closed by granulations. At the operation pus was found in the subdural space in the region of the frontal sinus.

In Carver's case an orbital periostitis and abscess complicated the case and seemed the cause of the preponderating symptoms. This had developed in the course of a chronic purulent sinusitis with acute exacerbations. It is interesting to note that the patient, as early as the third day, complained of pain on the top of his head, and that on the fourth and last days distinct meningeal symptoms appeared. This meningitis extended over the entire brain surface, as was shown at autopsy, all of the brain convolutions being covered with pus.

Without doubt the meningitis of the convexity was caused by disease of the superficial cerebral veins secondary to affection of the superior longitudinal sinus. The latter was found filled with a dirty, grayish pus.

In the autopsy report it is stated that the dura over the middle of the orbital roof was thickened, adherent, and necrotic. To my mind, however, this is not sufficient to account for this meningitis evenly distributed over the hemispheres.

If we review the pathological changes in these five cases, we find that a thrombo-phlebitis of the superior longitudinal sinus with a series of other complications may follow a chronic (four cases), rarely an acute (one case), purulent inflammation of one or of both frontal sinuses.

The symptoms may be local or general; the latter are of a pyæmic character and were present in two of the five cases.

The local changes can be divided into intra- and extracranial. The extracranial were not present in every case, and when so are in direct communication with the intracranial changes (extradural changes). They occur as subperiosteal abscesses situated over the frontal and parietal bones. Perforations in the bone show their origin.

The intracranial changes may develop within or without the dural cavity. The former—that is, the abscess—will here be situated below the frontal and parietal bones and may be overlooked (Carver).

The intradural changes are present in every case and lead to death, through circumscribed, one- or double-sided purulent meningitis of the convexity. In addition there may be symmetrically situated inflammatory foci in the frontal lobes. The superior longitudinal sinus was generally found to contain pus at autopsy. The extension of the phlebitis to the transverse sinus was only observed in one case.

The symptomatology of thrombo-phlebitis of the superior longitudinal sinus cannot be given from these five case-histories. It seems, however, that this affection does not produce severe brain symptoms up to the time of the onset of the meningitis. In the cases of Carver, Müller, and Roth,

meningeal symptoms did not appear earlier than the second, third, or fourth day before death. Müller's case especially confirms our view, because it can be definitely decided from the characteristic pathological processes that the thrombophlebitis had set in on the sixth day. The vomiting and headache which were present after the onset of the pyæmia (thirty-fifth day) were caused by an extradural abscess under the parietal bone. The thrombophlebitis in this case must have existed fifty days without causing severe brain symptoms.

The cases of Roth and Carver took such a rapid course that they are of very little use to us. The entire period of observation was two and four days. In the first case the meningitis had already appeared, and in the second only one day intervened before its onset. On this day the patient's sensorium was entirely clear, with a temperature of 109° and a pulse of 120.

Though inflammation of the superior longitudinal sinus does not produce severe brain symptoms, it is not, however, entirely without symptoms. I am very much inclined to regard as an expression of sinus affection the pains in the parietal region, of which Carver's patient complained, especially as in Müller's case a heavy, severe pain in the parietal region was associated with that of the frontal region.

Thrombophlebitis of the superior longitudinal sinus after frontal sinusitis may be divided into the following stages:

1. The prodromal stage: symptoms of sinusitis, fever, severe frontal headache.
2. The initial stage: pain in the parietal region.
3. Stage of regional abscesses (the disease has not become generalized): clinical appearances varying according to the site of the extra- or intracranial abscess and the presence with the latter of general brain symptoms.
4. Pyæmic stage: rigors, remittent fever, pulmonary complications, splenic tumor, etc.
5. Terminal stage: meningeal symptoms developing after one to four days.

The terminal stage may follow directly on the initial stage (fulminating course). Stages 3 and 4 may appear simultaneously.

As regards the diagnosis, it would be of the greatest aid to our therapeutic measures if the initial stage gave us some characteristic signs of the involvement of the superior longitudinal sinus. Perhaps well-observed cases will furnish us in the future with other diagnostic signs than parietal pain.¹

The diagnosis can be made in the stage of regional abscess, if the latter is situated extracranially. As long as intracranial suppurations exist, the presence of the intracranial complications can only be presumed by the general brain symptoms.

The differential diagnosis between an abscess originating directly from a diseased frontal sinus and indirectly by means of the superior longitudinal sinus, and meningitis, can only be made after opening the skull and by making a diagnostic puncture of the sinus.

The pyæmic symptoms are directly referable to this sinus. The meningitis can originate independent of the latter. A rapid case can only be explained at autopsy.

It is very important that, in all autopsies on persons dying of intracranial complications after a frontal sinusitis, the superior longitudinal sinus be carefully examined. If the latter is found diseased, all of the veins leading to the various abscesses must be also carefully investigated.

The treatment is analogous to that of thrombo-phlebitis of the transverse sinus after suppurations of the middle ear. Before the onset of a diffuse purulent meningitis, recovery without operative exposure and resection of the superior longitudinal sinus does not seem to be absolutely improbable, but the chances are very much more unfavorable on account of the intimate relations of the vessels of the brain with this sinus.

Description of Figures on the Plates VIII. and IX.

Fig. 1.—After Poirier.

S. l. s., superior longitudinal sinus.

S. fr., frontal sinus.

¹ In thrombosis of the superior longitudinal sinus from other causes, epistaxis and œdema of the scalp have often been observed.

Fig. 2.—After Poirier.

Art. ethm. ant., anterior ethmoidal artery.

Fig. 3.—After Breschet. Veins of the orbital lobe of the brain.

Fig. 4.—After Breschet. V. d. f., frontal diploëtic vein.

Fig. 5.—Veins of the scalp.

V. fr., frontal vein.

L. d. f. p., site of the parietal foramen.

Fig. 6.—After Poirier. Superficial cerebral veins.

A TRUE CHOLESTEATOMA IN THE POSTERIOR CRANIAL FOSSA—INFECTED BY MIDDLE-EAR SUPPURATION—OPERATION—RECOVERY.

BY DR. O. KÖRNER, OF ROSTOCK.

Translated and Abridged by Dr. EDWIN M. COX, of New York.

St. A., aged forty-one, came to the clinic June 13, 1900. The patient had suffered for years from severe headaches, which, beginning in the back of the neck, extended over the whole left side of the head. In the middle of March, 1900, he had influenza, followed by profuse discharge from the left ear. He was well and able to resume work in May, the discharge having ceased. Early in June the headaches began again, and the patient noticed a sensitive swelling on the left side of the occipital region, and these symptoms persisted until June 13th, when he came to the hospital.

When admitted he complained of the above mentioned pains and poor hearing on the left side. Midway between the left ear and the occipital protuberance there is a somewhat soft, flattened swelling about one and one-half inches in diameter. There is no change in the skin under the swelling. Through the centre of the swelling a triangular defect in the bone can be felt. This opening has sharp edges; no pulsation can be felt through it. There is apparently no change in the mastoid region.

The left auditory canal is unchanged; the membrana tympani is dull and thickened, somewhat bulging and reddened posteriorly. Puncture brought only blood and serum. Nothing noteworthy on the right side. No disturbances of equilibrium. The only abnormal condition in the eyes is optic neuritis and beginning venous stasis in both, most marked in the left. Temperature

37° C. Pulse 96 to 104. Speech and facial movements undisturbed.

Operation next day. As soon as the swelling was incised there was a flow of odorless pus to the extent of half an ounce. Protruding from the triangular opening in the bone was a shining, pearly mass which came away in layers when scraped with the spoon. Granulations covered the edges of the opening.

The whole mass, amounting in size to two hen's eggs, was removed by the scraping process. The bones of the skull covering the mass were only as thick as paper over a large area of the parietal, temporal, and occipital bones, and the diploë had entirely disappeared. The lower part of the occipital lobe and the cerebellar hemispheres were much displaced and compressed, and the dura to a considerable extent was covered with coarse granulations. Pulsation can be felt but not seen, and the cavity extends as far as the torcular Herophili. In many places the bone is eroded and some of the mastoid cells have been opened by this process; there is no sign of pus in them. The cavity was lightly packed with iodoform gauze and a strip brought out through the auditory canal. The patient did well continuously and on September 3d his wound was healed. The fundus oculi appeared to be restored to a normal condition. Patient gained 20 pounds during convalescence.

This extraordinarily large cholesteatoma lay in the posterior cranial fossa, and extended from the petrous portion of the temporal bone to the torcular Herophili. The bones in contact with the growth were everywhere thinned, and in one place perforated, and the mastoid cells were also opened. That the tumor had been growing a long time is made evident by the fact that it was so large, and also because it required four weeks for the brain and cerebellum to expand in the cavity to their normal proportions. The growth of the tumor must also have been slow, for it gave no symptoms until the headaches began. Soon after the apparent recovery from the attack of influenza and otitis media the symptoms began again and became more severe, and the sensitive swelling appeared in the occipital region. The optic neuritis also was observed for the first time.

The diagnosis lay between a tumor and an extradural abscess of otitic origin, some examples of which reach a great size and may perforate the cranial bones. The point of perforation, however, was too far posterior for this.

The infection undoubtedly reached the cranial cavity through the eroded mastoid cells from the tympanic cavity, during the intercurrent otitis media. The presence of the granulations was due to the suppurative process.

On October 3d this patient was seen. He feels well, the cicatrix does not pulsate, the drum membranes appear practically normal, and hearing also is nearly normal.

The microscopic appearance of the tumor was that of cholesteatoma.

A CASE OF PYÆMIA CAUSED BY BILATERAL
OTITIS MEDIA WITH OSTEOPHLEBITIS OF
THE TEMPORAL BONE.

BY DR. E. RIMINI, OF TRIEST.

Translated and Abridged by Dr. EDWIN M. COX, of New York.

SO much attention to pyæmia has, in recent years, been given by the otologist, that it seems worth while for me to report the case which I describe below.

E. S., aged seventeen, student was attacked in May, 1890, with pain in the right ear, and fever. The membrana tympani was seen to be much reddened, and bulging in its posterior segment. Paracentesis was done and relief followed the evacuation of much pus. Next day, signs of trouble appeared in the left ear and the same treatment became necessary, also with a satisfactory result. The patient did well for ten days, when he was seized with sudden headache and his temperature rose to 39° C. With the idea that pus had reaccumulated, paracentesis was repeated on each side but without benefit. The eyelids soon became œdematous, the first right metatarso-phalangeal joint swelled, the temperature rose to 40.2° C, and the headache became worse.

An operation was clearly indicated and the question as to which side should be attacked was decided by the otoscopic examination. This indicated the right side, upon which accordingly an operation was at once done. The right mastoid was found full of pus and the whole region was in consequence scraped out. The patient improved rapidly, and in eight weeks was discharged cured. The swollen toe joint developed an abscess and required opening.

This case is undoubtedly one of pyæmia, though there

was no chill. The abscess in the foot was certainly metastatic. The fact that the temperature remained high spoke in favor of a pyæmic process, and not for a simple abscess of the mastoid.

It is a question, however, whether the purulent material reached the blood current from the primary focus in the mastoid, or from a consecutive thrombo-phlebitis of the lateral sinus. Leutert¹ believes that pyæmia without sinus-thrombosis is so rare that it need not be taken into consideration, but it is not my purpose to discuss at length the question whether this interesting case falls in with these views, or with those of Körner on the subject of pyæmia from osteophlebitis. The latter says that in the form of pyæmia described by him, the most important points are the more frequent occurrence of the condition in acute ear disease with bone involvement, and also the frequency of metastases in joints and muscles instead of in the lungs, as is usual in cases of sinus-thrombosis. The case which we have described was one of acute infection and the metastasis was in a joint. The fact that the temperature fell at once after operation would indicate that the case was one of osteophlebitis.

It is to be remembered that an inflammatory thrombus in the sinus can be dissipated when the focus of first infection is cured, but the temperature fell too rapidly in this case for this condition to have existed. The disappearance of the pyæmic symptoms without operation on the lateral sinus affords additional evidence that the condition was one of pyæmic infection from osteophlebitis without infection of the sinus.

¹ "Ueber die Otitische Pyämie," *Arch. für Ohrenhkd.* Band 41.

TWO CASES OF BRAIN ABSCESS—OPERATION —RECOVERY.

BY DR. P. MANASSE, STRASSBURG.

Abridged Translation by Dr. ARNOLD KNAPP.

CASE 1.—R. D., aged thirty-three. No previous ear trouble. Suddenly suffered severe pain in the right ear five weeks ago; otorrhœa set in after two days and was profuse until one week ago. Then severe pain, cessation of discharge, swelling behind and above the ear, vertigo, tinnitus, deafness, and moderate fever.

On admission January 30, 1900—Ear canal stenosed, filled with pulsating pus, posterior and upper walls sunken, *Mt* not visible. There was an œdematous, bluish, painful swelling at upper part of auricle; mastoid tender.

Whisper $r=0$; voice $r=1$ *m*. Weber to right. No loss of equilibrium. T. 37.9° . Urine normal.

Operation, Jan. 31st.—Incision back and over the auricle, through the abscess down to the bone. The periosteum was retracted and a fistula as large as a bean and with sharp uneven edges was found above and back of the auditory canal one half *cm* distant from the margin from which pus was escaping. This fistulous opening was enlarged, the bone being very brittle and invaded with pus and granulations. The fistula led to dura, which was discolored and bathed with pus. An opening 1 by $1\frac{1}{2}$ *cm* was found communicating with a small cavity in the temporal lobe. The cavity contained pus and brain debris to a depth of 1–2 *cm*. The entire brain abscess was not as large as a walnut. The tegmen antri and a part of the squama were removed, exposing healthy dura in every direction. Finally the antrum was opened and found filled with pus and granulations. The wound was packed with iodoform gauze.

Healing followed without interruption.

Feb. 16th.—No packing introduced in brain wound.

April 8th.—Discharged without symptoms.

Dec. 22d.—Patient is seen again. The wound is firmly healed. No symptoms. *Mt* closed. Whisper heard in 4 *m*.

This was a case of acute otitis media, followed by otitis of the temporal bone and formation of a brain abscess in a relative short space of time. The latter had given no symptoms and was only detected at operation by a fistula leading through the bone and dura into the substance of the temporal lobe. The otitis, otitis, and brain abscess are now completely healed.

CASE 2.—K. St., twenty-four years old, with right otorrhœa since childhood; has suffered with severe headache for four days, and a weakness in the left arm and leg.

Admitted Nov. 10th. Fully conscious; complains of severe headache. The head is freely movable. T. 38.4°. Pulse 48. Herpetic vesicles on upper lip. Slight paresis of arm, leg, and face. Left *Mt* normal. Right: polypus in auditory canal surrounded by white cholesteatomatous masses with fetid pus. Mastoid process not abnormal. Fundus oculi: on both sides dilated veins, undefined margins of the papillæ.

Diagnosis: Cholesteatoma of right middle ear. Abscess in right temporal lobe.

Operation.—Bone very white and hard. The antrum contains cholesteatomatous masses and pus. The posterior wall of the canal is removed. There are no ossicles. After removal of tegmen antri and tympani the dura is found covered with granulations at a small area over the antrum, and is further exposed in the region of the squama.

Aspiratory puncture of the temporal lobe is made at the side of the granulations; the syringe became filled with greenish-brown stinking pus. The dura and brain are incised and a cavity containing about 100 *ccm* evacuated. The walls of this abscess, as large as a hen's egg, are green, uneven, with many depressions and pockets. The cavity is gently curetted and packed with iodoform gauze.

Nov. 12th.—Dressing changed; some pus in cavity; temp. 38.4°; pulse 48.

Nov. 17th.—More pus evacuated.

Nov. 24th.—Vomiting, headache; paresis of left arm more distinct; pulse 50.

Nov. 28th.—Pulse 48; the finger is introduced in wound; pus and necrotic brain substance released.

Dec. 5th.—Condition improved; pulse 62, soft.

Dec. 7th.—Pulse 72; fundus oculi: swelling of discs less, numerous hemorrhages.

Gradual improvement followed; pulse normal; wound smaller, healing rapidly. The patient is up all day, no symptoms; the pareses have disappeared and the fundus image is returning to the normal.

This patient, in the course of an old chronic middle-ear suppuration, suddenly showed the typical signs of a brain abscess with paralysis of the opposite side. The radical operation was immediately performed and the abscess evacuated. The abscess was quite large, filled with fetid, greenish pus; without a lining membrane.

On comparing these two cases we find the first difference in the etiology. The abscess in the first case followed an acute, in the second a chronic otitis. The history of the first case extended only over five weeks, while in the second the otorrhœa was of twenty years' standing and the abscess had probably existed for quite some time.

The cases presented the following anatomical differences. In the first the abscess contained yellowish-red, thick, and odorless material. The walls were formed by hemorrhagic infiltrated brain substance. In the second abscess the contents were thin, greenish-black, fetid, and the wall was an uneven, greenish mass quite unlike brain tissue. The two abscesses were of unequal size: the first and acute one was small, with very little pus; the second and chronic one contained about 100 *ccm.*

Regarding the symptoms, there were none suggestive of a brain abscess or an intracranial lesion present in the first case. In the second there were:

1. Typical general symptoms: headache, choked disc, slow pulse, later vomiting.
2. Local symptoms, such as paresis of the left arm, leg, and face. These local symptoms are rare in abscesses of the temporal lobe.

Treatment in both cases was the same: eradication of the

primary focus; then opening and draining the abscess in the usual manner.

The prognosis was unfavorable in these cases, as the abscesses were not encapsulated. According to our experience, the encapsulated abscesses are more favorable; the diffuse abscesses without a firm membrane are unfavorable because it is difficult, on account of the prolapse of the brain tissue, to control all the pockets, and retention of pus with its complications is apt to follow.

THE TECHNIQUE OF INTRANASAL OPERATIONS.

BY DR. ALFRED DENKER, OF HAGEN.

Translated and Abridged by Dr. EDWIN M. COX, of New York.

IN all surgical work, the aim is to prevent loss of blood, on the one hand because the patient's interests are thus served, and on the other, because the field of operation is thus kept free from blood. In most parts of the body hæmostasis is usually easy to accomplish by one means or another, but in the cavities which are necessarily worked upon at a depth and by artificial light, the control of hemorrhage when the mucous membrane is cut is a matter of difficulty. This is notably the case in operations upon the nasal septum, the vessels of which cannot, of course, be ligatured. The galvano-cautery furnishes one means by which operations upon the septum and turbinates can, as a rule, be rendered practically bloodless, and Ostmann, in Band ix. of *Archiv für Laryngologie und Rhinologie*, has given a special method by which this result can be attained. This method resembles very closely the plan which I have advocated during the past few years of using the galvano-cautery as a preparatory act in operations on the bony and cartilaginous portions of the interior of the nose. Two objects are attained by this use of the cautery. The patient is not disturbed by the flow of blood into the pharynx and from the nostrils, and the field of work is not obscured, so that no time is lost; and, furthermore, secondary hemorrhage is not so likely to occur, tamponade being thus avoided. Kreils-

heimer¹ speaks well of the use of the galvano-cautery after operations to prevent secondary bleeding, but does not emphasize the usefulness of the same instrument before operations in order to avoid hemorrhage at the time of operation, according to the method suggested by Ostmann and myself. For the removal of the ordinary hypertrophic masses of the middle and inferior turbinates, I have found the hot snare very satisfactory, but I think that for the removal at one sitting of several of the very large hypertrophies, it is a good plan to divide the afferent vessels according to the method suggested.

In making resections of the cartilaginous and bony prominences of the septum, I proceed according to the following plan, using 10% cocaine solution as an anæsthetic: If the obstruction is an antero-posterior prominence, it may be furrowed deeply with the suitable cautery point in the lines along which the chisel or saw is to be operated, and after this one of the latter instruments may be used without causing any particular hemorrhage. The galvano-caustic action must be permitted to go entirely down to the bone or cartilage, as the case may be. The removal of a spine is accomplished in the same way. In removing a portion of the inferior turbinate, I follow the method of Ostmann, which consists in the same use of the cautery, with subsequent removal of the mass with the scissors.

My experiences have shown that the use of the galvano-cautery in this way in nasal operations prevents hemorrhage and obviates the necessity of tamponade.

¹ *Arch. f. Laryng. u. Rhin.*, Heft 2, Band ix.

THE HISTOLOGY OF AURAL POLYPI.

By DR. G. BRÜHL, BERLIN.

Translated by Dr. ARNOLD KNAPP, New York.

I.

THE first histological examinations of aural polypi were made by Pappenheim in 1840. Numerous papers on this subject have since appeared. The authors divide aural polypi into mucous and mucous-gland polypi, round-celled polypi, fibromas, myxomas, fibro-myxomas, angiomas, angio-fibromas, and granulation polypi. It is now generally accepted that all aural polypi are at first granulation tumors which secondarily develop into the other tumor forms. The term "mucous-gland polypus" should be dropped, because mucous glands rarely, if ever, occur in aural polypi. Schwartze recognizes aural polypi with epithelial covering, and polypoid granulations without epithelium, a distinction which Kuhn does not recognize, but which has recently been taken up again by Jacobson.

The number of new methods of histological investigation have induced me to take up the subject of the histology of aural polypi again.

II.

Sixty aural polypi, after fixation in alcohol or sublimate, were stained by the following methods, which may also be recommended for histological examination of the ear in general.

1. Double stain with hæmatoxylin-eosin.
2. Benda's iron hæmatoxylin.

- (a) Section in 30% ferrous-sulphate solution for ten seconds.
 - (b) Distilled and spring water.
 - (c) 0.5 % hæmatoxylin solution.
 - (d) 1 % acidulated alcohol.
 - (e) Distilled water, absolute alcohol, xylol, and balsam.
3. Hyalin stain, after Unna.
- (a) Overstain in hæmatoxylin.
 - (b) Water.
 - (c) 1 % saffranin solution, ten minutes.
 - (d) Water.
 - (e) 33 % watery solution of picric acid, thirty seconds.
 - (f) Water.
 - (g) Alcohol, oil of bergamot, and balsam.
4. Plasma-Mastzellen stain, after Unna.
- (a) Polychrome methylene blue, fifteen minutes.
 - (b) Decolorize in water with the addition of one drop of glycerin-ether mixture.
 - (c) Water.
 - (d) Alcohol, oil of bergamot, and balsam.
5. Elastin stain, after Unna.
- (a) Ten minutes in warm orcein solution (orcein 1, hydrochloric acid 1, absolute alcohol, ad. 100).
 - (b) Acidulated alcohol, six seconds.
 - (c) Water.
 - (d) Alcohol, oil of bergamot, and balsam.
6. Elastin stain, after Weigert.
- (a) Weigert's fuchsin, twenty minutes (fuchsin, 2, resorcin, 4, distilled water, 200).
 - (b) Alcohol.
 - (c) Xylol, balsam.

The hæmatoxylin-eosin stain was used in all cases, and served to control the results obtained by the other stains. For Unna's stains, hardening in absolute alcohol alone was used.

III.

Many aural polypi were found to contain an unusually large number of cells. This necessitated a more exact study

of the cells, especially Unna's plasma cells. Most aural polypi are round-celled. These round-celled polypi afford unusual opportunities for the study of comparative cellular structure.

Unna regards the term round-celled as erroneous, in which opinion I concur. If a section of a round-celled polypus, stained with hæmatoxylin-eosin be examined with an immersion lens, the difference between the cells is very apparent. This distinction is even more striking with Benda's stain, and with the selective staining methods of Unna. Most all polypi, which we prefer to call polypoid granulations, owing to their anatomical similarity to granulations, contained, in addition to the epithelium, the following varieties of cells, which Justi has also found in numerous granulations:

1. Polynuclear leucocytes.
2. Mononuclear leucocytes.
 - (a) Small (lymphocytes).
 - (b) Large.
3. Formative cells of connective tissue (fibroblasts).
4. Formative cells of the blood-vessels.
5. Giant cells.
6. Unna's plasma cells.
7. Mastzellen.

These cells are present in polypoid granulations in the ear in varying quantities and are collected together in a granular intercellular substance. The intercellular substance shows a fibrillary structure when the granulation begins to shrink. The polypoid granulations have numerous thin-walled blood-vessels which become thick-walled in the process of shrinkage.

The polynuclear leucocytes are situated in the blood-vessels, in their neighborhood, and frequently in groups, especially near the surface of the polypus. They were also found between the epithelium cells on the surface, occasionally grouped so closely as to almost hide the epithelium.

Stained with hæmatoxylin-eosin, the protoplasm is pale and the darkly stained nucleus presented many chromatin granules. Nuclear remnants were often found in the midst

of these collections; their origin from polynuclear leucocytes was clearly to be seen. Stained with Unna's polychrome methylene blue, the polynuclear leucocytes have a dark blue nucleus, but the protoplasm is always unstained. In addition to the polynuclear leucocytes, *mononuclear cells* with round nuclei were also present. Some of these were small (lymphocytes) and were collected together like follicles; others were larger (8-10 μ) and their protoplasm stained light red with eosin. Their nucleus was frequently situated eccentrically and presented a nuclear network with large, peripheral chromatin granules. If we compare these cells with the leucocytes found within the blood-vessels, it is readily seen that the latter are mononuclear leucocytes. These large mononuclear leucocytes are collected in groups about the vessels, which they accompany throughout the tissue.

When stained with polychrome methylene blue, the large mono- or polynuclear leucocytes partly show a definite stain of the protoplasm. The protoplasm ring of the lymphocytes may be stained evenly pale blue, but never in the characteristic way of the large leucocytes. In a large part of these the protoplasm of the cell body is dark blue and granular, the cell centre is paler, and the round nucleus a deep blue. Chromatin granules are found at one extremity of the cell.

If we compare two successive sections from the same polypus, we find the cells which, stained with the hæmatoxylin-eosin we have taken for mononuclear leucocytes, show, on being stained with polychrome methylene blue, the characteristic protoplasm stain. They are, in other words, Unna's *plasma cells*.

The polypoid granulations also contain oval or elongated spindle-formed cells. These have a large (6 μ) pale nucleus and a finely granular chromatin network. The protoplasm is frequently striated and is stained a light red with eosin; it frequently shows elongations. These connective-tissue cells, *fibroblasts*, are not found in large numbers in between the leucocytes, but are more frequent when the polypoid granulation tends to shrinkage; at the same time the fibrillar intercellular substance is present. Stained with polychrome methylene blue, the fibroblasts usually present an unstained

protoplasm, though occasionally it may be blue with fine granules, but never in the characteristic manner of the plasma cells. The nucleus has a blue chromatin network and rarely large blue granules. Oval cells with blue nuclei, resembling fibroblasts, are found in the walls and in the neighborhood of the blood-vessels. The vessels often show signs of vascularization, rarely buds and elongations. The walls of the vessels in polypoid granulations undergoing shrinkage are concentrically thickened by grouping of the cells which contract, almost obliterating the lumen. Polychrome methylene blue does not stain the protoplasm of those cells formed from the vessels.

The giant cells which we find in polypoid granulations present between ten and forty nuclei in a homogeneous protoplasm. There is usually no evidence of tuberculosis. According to Ziegler, giant cells are explained by cell division of fibroblasts without participation of the protoplasm. Finally, in sections stained with polychrome methylene blue, we encountered cells which were very noticeable on account of their color reactions. These were large oval or fusiform cells with granular red protoplasm and a centrally situated blue nucleus rich in chromatin. These cells were *Mastzellen* and were usually situated near the surface of the polypoid granulations and covered with epithelium.

The study of our sections of polypoid granulations enables us to express the following view as to the nature of Unna's plasma cells: This term, as is well known, was introduced by Waldeyer for certain connective-tissue cells. Unna believed he had found a definite color reaction (blue staining of the granular protoplasm) for these cells with his polychrome methylene blue stain. According to Unna, plasma cells are hypertrophied connective-tissue cells through the agency of some infectious irritation. They alone show this characteristic color reaction, according to him. Jadassohn believes that the plasma cells are derived from migrated leucocytes, but does not consider that it has been proved that Unna's reaction is sufficient to distinguish the derivatives of these cells from leucocytes rich in protoplasm. A number of other investigators have expressed themselves

against the purely connective-tissue origin of plasma cells. Unna has recently recognized the indisputable identity of the small (daughter) plasma cells with the so-called lymphocytes.

Our findings in the polypoid granulations of the ear showed that the plasma cells are identical with large mononuclear leucocytes. The greater part of the polypoid granulations in the ear is formed by plasma cells.

Unna says that a severe irritation acting upon fully developed tissues is necessary for their origin, which holds true in the polypoid granulations produced by aural suppurations. Justi believes that plasma cells serve to transport certain products from the tissues to the lymph channels. The numerous quantity of plasma cells to be found in polypoid granulations is an evidence that great cell formation and still greater cell destruction are favorable conditions for their development.

Elastic fibres were sought for in the polypoid granulations with the aid of the Unna-Taenzer and Weigert's stain. They were, however, only found in the walls of the blood-vessels. This can be explained by Kromayr's statement that the formation of elastic fibres is greater and more rapid the slower the tissue grows and the farther removed it is, theoretically, from inflammatory granulation tissue.

We frequently came across the so-called Russell's fuchsin bodies, small or large hyalin discs staining light red with eosin and tomato-red with Unna's hyalin stain. In many specimens stained with hæmatoxylin-eosin there were large mononuclear leucocytes, whose red protoplasm appeared homogeneous, and the crescentic blue nucleus near the periphery could only be made out with difficulty. Unna's stain gave this protoplasm a tomato-red color. Most of Russell's bodies resembled these cells both in size and in location. One Russell's body was found in the midst of a hemorrhage. Some authors are inclined to regard these bodies as derivatives of round cells. We are inclined to agree with Schmaus and Böhm that the Russell's bodies are derivatives of large mononuclear leucocytes—that is, the hyalin product of their protoplasm.

In regard to the presence of glands, it is well known that, if epithelium similar to the surface epithelium dips into the underlying tissue, it appears like a gland on cross-section. We have, however, observed polypi with squamous epithelium on the surface and with shut-off spaces lined with cylindrical epithelium, which simulated glandular ducts. In any case, glands are very rarely found in aural polypi.

The epithelium covering a polypus is not always like the epithelium of the mother tissue. The mucous membrane of the mastoid cells has a very thin layer of squamous epithelium. The middle-ear polypus which arises from it, and which is often incorrectly called "polypus of the aural canal" (von Tröltsch), ought to present the same epithelium as the mother tissue; they were, however, in all cases, covered either with epidermis of the neighboring integument of the aural canal, for their origin was always in the cells of the posterior wall of the auditory canal. Polypi from the promontory are not covered with cubical epithelium, as is the promontorial membrane. Stratified squamous epithelium, as certain middle-ear polypi possess, has never been found in the normal tympanic membrane. The epithelial covering, whether squamous or cylindrical, can never be regarded as a distinguishing feature between a polypus of the canal and one of the middle ear. The same polypus may show both kinds of epithelium in rapid variation, which presumably depends upon entirely different causes than the epithelium of the mother tissue. It is well known that the epithelium covering aural polypi may be destroyed by suppuration and may never be permitted to develop. Hence the epithelial covering never gives us a safe guide to the origin of the polypus. The mother tissue characterizes the polypus, but not its envelope.

In our specimens there were 47 polypoid granulations, 8 fibromas, 5 myxo-fibromas. Of the 47 polypoid granulations, 26 were without epithelium, 21 with an epithelial covering.

Of the 8 fibromas all showed epithelium. Of the 5, myxo-fibromas, all had an epithelial covering.

The kind of epithelium was in the

21 polypoid granulations : 8 fibromas : 5 mixo-fibromas:

Cylindrical,	9 times	2 times	1 time
Squamous,	7 "	5 "	4 times
Mixed C. and S.	5 "	1 time	0

The question whether aural polypi are tumors and what position we should give them in pathological histology can be answered by first stating the following sentence of Ziegler's: "The tissue formation which leads to the development of a growth, of a neoplasm, or of a tumor in the stricter sense, is a process which cannot be compared with hyperplastic granulations or to inflammatory tissue formation."

Most of the polypi arise in the course of a protracted aural suppuration. These suppurations cause extensive destruction of the skin, mucous membrane, periosteum, and bone of the ear, and this destruction of tissue is followed by an attempt at repair by the formation of granulations; obliteration of the vessels, development of connective tissue, sclerosis, and cicatrization do not occur in the granulations as in the normal process of healing; on the contrary, the continued injury to the tissues forms a constant incentive to the development of blood-vessels, migration of cells, and proliferation—in other words, to increased growth of the granulation. If this is true for the hyperplasias occurring in the ear in the form of polypi, these must be inflammatory tissue formations and not new growths.

The anatomical picture of granulation tissue was present in 78.3% of our polypi; histologically, therefore, a part of the aural polypi may be regarded as polypoid granulations.

In polypoid granulations, we have to distinguish between those with none and those with little fibrillary intercellular substance. The former are the more common. In about 25% we found sparse fibrillary tissue associated with many fibroblasts and hypertrophied vascular walls. At the same time, polypoid granulations at this stage of connective-tissue development cannot be regarded as fibromas or angio-fibromas, because they still show cells of inflammatory irritation in preponderance—namely, polynuclear and mononuclear leucocytes and plasma cells. There were more cells than

basement substance and the epithelial covering was often wanting. In the fibromas and myxo-fibromas of the ear there is always more basement substance than cells. Wherever larger collections of cells were present, these were not of inflammatory origin, but resembled lymphocytes collected together in follicles, or as in adenoid tissue. The surfaces of the fibromas and myxo-fibromas were in all cases always covered with epithelium. *Polypoid granulations of the ear are consequently not tumors, but inflammatory tissue formations.*

In the case of the fibromas and myxo-fibromas of the ear, the question arises whether these are really tumors or the result of local inflammatory tissue changes and hyperplasias. As in the urethra, under constant irritation of pus, fibrous hyperplasias are formed,—condylomata,—so in chronic suppurations of the ear hyperplasias appear in the form of polypi. These are to be regarded as fibrous and myxo-fibrous hyperplasias and are no more tumors than are the polypoid granulations. At the same time, fibromas and myxo-fibromas are distinct histologically from the polypoid granulations, even if the latter begin to form connective tissue.

Fibromas and so-called myxo-fibromas, originating by cedematous infiltration of the connective-tissue fibres, demand histologically an independent position. We consider them tumors, but cannot regard them as terminal stages of polypoid granulations.

The simultaneous occurrence of fibromas and granulation polypi in the ear does not prove that the fibroma is derived from the granulation polypus. Granulation polypi may become *fibromatous, but not fibromas.*

The age of polypoid granulations does not necessarily influence their histological structure. Most of the polypi are comparatively old, having existed for a number of years. The duration of their existence was in most cases fully sufficient to have permitted the transformation of the polypoid granulation into a fibroma or myxo-fibroma before their removal; and we should, consequently, in the majority of extirpated aural polypi, find fibromas or myxo-fibromas.

Histological examination of aural polypi, however, has shown the preponderance of polypoid granulations. Moos and Steinbrügge found amongst a hundred polypi, fifty-five granulation tumors, twenty-seven angio-fibromas, fourteen fibromas, and four myxomas. If we regard the twenty-seven angio-fibromas as fibromatous polypoid granulations, then we have eighty-two polypoid granulations (82 %). Weydner found amongst seventy-three polypi, fifty-six polypoid granulations and seven fibromas.

We found in sixty polypi, forty-seven polypoid granulations, eight fibromas, and five myxo-fibromas. These three statistics show that 78 % of all aural polypi are polypoid granulations. Hence, it seems to us essential to regard all aural polypi as various stages of the same process. There are young aural polypi which have the characters of fibromas, and old polypi which are polypoid granulations. Polypoid granulations remain as such, fibromas have from the very beginning a tendency to become fibromas.

The majority of aural polypi, 78 %, are not tumors, but are inflammatory tissue formations. The minority, 21.7 %, are tumors. These, in our cases, were always covered with epithelium, while the polypoid granulations were only so covered in about one half the cases.

According to the histological structure all polypi may be divided into polypoid granulations (partly fibromatous) and fibromas (partly myxo-fibromas).

OPERATIONS ON THE MASTOID IN CONSTITUTIONAL DISEASE.

BY DR. ERNST BARTH, BRIEG, NEAR BRESLAU, GERMANY.

Translation by Dr. ADOLPH O. PFINGST, Louisville, Ky.

A.—A case of mastoiditis in a diabetic subject.

THE operative treatment of suppurative mastoiditis occurring in diabetic subjects has been so little discussed in medical literature that I feel justified in reporting a recent case from my practice. The case is of especial interest when considered from the standpoint of the advisability of undertaking major operations upon diabetics. This has ever been a disputed question, and each case added to literature may eventually lead to a uniformity of opinion as to the significance of sugar in surgical cases.

A male, sixty-four years old, apparently in good general condition, gave a history of a double iritis a year previously. He gave no other history or showed no other evidence of a syphilitic infection. At the time of the eye trouble it was discovered that diabetes existed. There was then 4 % sugar, which was rapidly reduced to 2 % by dietetic treatment. A year later and while the patient was still keeping up an antidiabetic diet, he contracted an acute middle-ear inflammation on the right side, following a bath on a cold day. His temperature became elevated, his head ached, and the ear discharged a reddish and later a purulent fluid. At the same time he had a slight nasal hemorrhage.

On June 18, 1899, when I first saw the patient, there was a profuse discharge of thick yellow pus from the right ear. The drum was thickened and red, and was marked in the postero-inferior quadrant by a light reflex indicating the point of exudation of the

pus. There was slight tenderness on pressure over the tip of the mastoid, otherwise the external parts were normal. The patient could hear a whisper with right ear when spoken directly into the ear. Bone-conduction from vertex best towards right side. The temperature was 100.4° – 100.9° F. The urine at this time contained 2.5 % sugar. Following the use of cold locally, rest in bed, and strict antidiabetic diet, with frequent irrigation of the ear, the temperature soon returned to normal. Otorrhœa remained profuse, while the tenderness over the mastoid slowly increased, and some swelling became evident. Tenderness and swelling very slowly increased, but owing to the age of the patient and the presence of 2.5 % sugar, surgical interference was delayed as long as possible. In August, although the urine contained only 1% sugar, none of the other symptoms had subsided. On the contrary, the swelling had now extended to the posterior wall of the ear canal. The membranous wall soon gave away, a quantity of pus discharging through the opening. A probe introduced through this opening came upon necrosed bone. Throughout September there was but little change in the condition. Sugar, 1%. In October a decided change for the worse was apparent. While otorrhœa continued, the temperature rose to 101.4° – 100.3° F., the pulse being correspondingly accelerated. Sugar had increased to 2½% notwithstanding a strict antidiabetic diet. Sensitiveness over the mastoid was now pronounced and persistent headache was complained of. A loose piece of bone could be felt through the fistula in the posterior ear-canal. Swelling had extended down the mastoid a little below the tip, making movements towards that side of the head difficult and painful. An operation was now imperative, and was performed Oct. 9th, under chloroform narcosis. The mastoid was found discolored, bluish, and was soft as far as the tip; upon elevating the periosteum pus exuded freely from between the posterior bony ear-canal and the soft parts. After a few strokes of the chisel, almost the entire posterior osseous ear-canal came away, and a sequester as large as a bean. It took but little chiselling to enter the antrum, thereby completing a radical operation. The ossicles were carious; also the tip of the mastoid, which was removed. Koerner's plastic.

The patient stood the operation well and improved rapidly. The temperature soon returned to normal, and by observing strict rules of diet sugar entirely disappeared from the urine in two weeks. The wound, which was unusually sensitive, healed

very slowly, though without complication. It required seven months for complete closure to take place. Two weeks after the operation another small sequester was detached from posterior part of the wound.

A feature in this case worthy of mention was a scaly formation upon the skin in the vicinity of the wound, especially in the concha. This not only lasted during the process of healing, but persisted afterwards and yielded only to treatment with borated vaseline.

The function of the right ear was reduced so that a whisper could not be heard. He could, however, hear ordinary conversation with that ear. From vertex, sounds were best conducted towards the right ear. For tuning-fork the conduction by air was lost on right side; for bone it seemed about normal. A clinical feature of interest in this case was a disturbance of the power of maintaining the equilibrium. It began about the third or fourth month and was described by the patient as an unsteady feeling, especially upon arising or during physical exertion. It could best be controlled by steadying the head with the hand. This symptom was very marked whenever the patient suddenly turned around. It was never present when writing or reading. This condition has remained to the time of this report—nine months after the operation. The patient has had no other treatment than dietetic.

This case teaches us that it is not always advisable to defer operative measures upon diabetic subjects too long. Had this case been operated upon four weeks after the mastoid inflammation set in, at a time when the urine contained but 1 % of sugar, I believe that a much better chance would have been given the patient for retention of his hearing. During the time that I waited, necrosis was going on in the bone and the tympanic cavity.

We further learn from this case that even at sixty-four years, with $2\frac{1}{2}$ % sugar in the urine, and with necrosis going on in the bone, good results can be expected from major operations.

I have been unable to account for the disturbance of the equilibrium. It appeared while the wound was healing and after the urine ceased to contain sugar.

B.—A case of suppurative mastoiditis. Operation. Process of repair interfered with by gout.

It is not uncommon to find evidences of gout in the external ear. Garrod claims that gouty nodes can be found in the concha in about fifty per cent. of all cases of arthritis. Brieger and Ebstein have expressed similar views, the latter laying some stress upon the diagnostic value of the presence of these gouty nodes.

So far no evidences of gout have been found in the middle or internal ear. The following report represents a case of mastoiditis in which gout retarded the process of repair :

A male, aged sixty-three years, complained of severe headache during an attack of coryza. Six days later, the left ear began to discharge pus. The headache persisted, and the mastoid gradually became sensitive to pressure, while the soft parts became swollen and red. The right drum was normal ; the left, dark red and marked in its postero-inferior quadrant by a pulsating light reflex. Sounds from a tuning-fork on the vertex were conducted to the left side. The patient could hear whisper on left side only when spoken directly into the ear.

On April 26th, the drum was incised and leeches applied externally, but without avail. On April 28th, I opened the mastoid under chloroform narcosis. Upon removing the normal cortex, the mastoid cells were found filled with pus. The spongy bone was removed with a curette, thereby creating a large cavity surrounded by healthy bone. On the day following the operation, the patient was doing well ; but on the second day the temperature rose to 103.6° F. without being preceded by a chill, pulse 100, and the headache returned. The wound had become very sensitive to pressure. My anxiety over these untoward symptoms was relieved by the discovery that the patient had a typical case of gout, which had been overlooked by him on account of his ear trouble. The metatarso-phalangeal joint of the left big toe was much swollen and the skin over it tense and reddened. There were no gouty nodes in the ear, but the wound behind the ear was extremely sensitive, somewhat swollen, and red. The bone was not affected. The swelling and redness disappeared, as they came, with the swelling of the toe ; four grams of sidonal being administered daily. In the weeks following, the patient had other, though milder, attacks of gout, and each time the edges of

the mastoid wound became sensitive and red, and again returned to normal with the subsidence of the gout.

It is evident that the infiltration of the mastoid wound in this case was a gouty condition, not only on account of its coincident beginning and termination with the swelling in the toe, but on account of its influence upon the repair of the wound. The process of repair was exceedingly slow, and was hastened by none of the local remedies applied—nitrate of silver, camphor, or iodoform. The otorrhœa was not influenced by the gouty condition, as is evidenced by the disappearance of pus and closure of the drum soon after the operation. The patient could hear whisper at three feet. The tuning-fork was still heard best on left side from the vertex. As there was more functional disturbance following this case than is usual in uncomplicated cases, I take it that gouty deposits had also taken place in the tympanic cavity.

C.—Tuberculosis, middle-ear and mastoid suppuration occurring simultaneously with pulmonary tuberculosis. Operation. Recovery.

Middle-ear and mastoid disease complicated by pulmonary tuberculosis is a subject of much interest on account of the variability of symptoms and on account of the difficulty of determining whether the cause of the symptoms is in the ear or in the lung. The following case is one rather out of the ordinary:

Male, twenty-one years old, in good general condition, dates his trouble back to January, 1900, when he had an acute pharyngitis. Following this, his left ear began to discharge pus. He applied to me for treatment on February 3d, because the otorrhœa had become more and more profuse. The left ear canal at this time was very much narrowed in its depth by swelling of the posterior and antero-inferior walls. The narrow aperture rapidly filled up with pus when cleansed. The mastoid appeared normal. The hearing of the left ear was so reduced that the voice could not be heard when spoken directly into the ear. The tuning-fork on vertex was best heard on the left side.

The patient was put to bed and treated by frequent irrigations and loose packing with iodoform gauze. The profuse discharge

continued, and although the patient had afternoon temperature ranging from 101.3° F. to 102.2° F. he complained of no pain or discomfort. At this time he began to have night-sweats, which led me to examine his lungs. I found that the right upper lobe was involved. There was dulness on percussion, short inspiration, and bronchial expiration. There had never been any cough or pains in the chest. While this condition, together with the absence of pain in the ear, led me to suspect a tuberculous ear-affection, it was impossible to demonstrate the presence of tubercle bacilli in the pus.

The profuse flow of pus continued, also the afternoon rise in temperature, no other symptoms, however, to indicate mastoid involvement appearing. On February 12th, fearing involvement of the bone on account of the profuse otorrhœa, and that more serious complications might arise, I decided to open the antrum. Under chloroform narcosis, pus was reached by removing a small piece of the cortex. The pus contained unmistakable tubercle bacilli. The mastoid cells and antrum were cleansed of pus and granulation tissue, and the wound dressed with iodoform gauze. The patient stood the operation well, but his condition otherwise remained unchanged. The profuse otorrhœa continued, as did the afternoon rise in temperature.

After about a week pus was discovered coming from the angles of the wound. With a probe it was found to be coming from two fistulous tracts running well under the skin and into the muscular tissue. On Feb. 23d they were split under chloroform narcosis, all of the diseased tissue removed, and the wound tamponed with iodoform gauze.

On March 10th there was still no appreciable decrease in the amount of secretion from the ear canal. The swelling in the ear canal was also as marked as it was before the operation, only a narrow strip of the drum being visible. Spongy granulation tissue had formed at the bottom of the cavity in the bone. This was curetted, and though done without a narcotic, did not cause the slightest pain.

March 15th.—The temperature, which heretofore had seldom run over 101.3° , has for several days exceeded that. The physical signs over the left lung were unchanged, but the patient now complained of pain in the throat, especially upon swallowing. Examination of the throat revealed nothing markedly abnormal.

March 16th.—The left half of the soft palate was now displaced forward and was sensitive to touch at upper end of the anterior faucial pillar. A large amount of pus was evacuated upon incision of the swollen area. Tubercle bacilli could not be found in this pus.

The opening of the peritonsillar abscess marks the turning-point in this case, for in several days the temperature had returned to normal, and the otorrhœa had ceased. The wound in the mastoid took its normal course, and closed perfectly in nine to ten weeks. When the patient was discharged, he weighed twenty-six pounds more than at the time of his admittance to the hospital. The lung had returned to normal, auscultation sounds being the same on both sides. Normal respiratory murmur was again audible on the left side. The perforation in the drum had closed. The Eustachian tube was open. Conduction by air was better than by bone on the left as well as the right side.

From the vertex sounds were still conducted best to the left side. Whispers could be heard at five feet with this ear. This perfect result has remained unchanged up to the time of this report (five months), the patient now being in a perfect physical condition.

There can be little doubt as to the nature of this case. There was not only involvement of the upper lobe of the left lung to indicate tuberculosis, but the tubercle bacillus was found in the pus removed from the mastoid during the operation. The unusually profuse discharge of pus, the absence of earache, and the formation of fistulous passages at the angles of the wound in the mastoid were also indications of tuberculosis. The question arises whether we were dealing with a primary tubercular trouble in the mastoid, in which the tympanic cavity was secondarily involved, or whether the infection was carried from the respiratory passages into the tympanic cavity.

Infection through the Eustachian tube does not seem probable when we consider that the patient had no cough or expectoration or bronchial inflammation. The return of the tympanic cavity and membrane to normal is strong evidence that tuberculosis did not exist in these parts, or there would have been extensive destruction in the

tympanum and necrosis of bone. It seems that in our case the tubercular process was in the mastoid bone and that the tympanic cavity and perforated drum acted as a passage for the escape of pus. It is not meant by this that the tympanic cavity was entirely inactive in the formation of pus. The continuance of the otorrhœa after opening and cleansing the mastoid was evidence that the tympanic cavity was concerned in the pus formation. Whether the peritonsillar inflammation influenced it, is a question difficult to solve. Certainly, the immediate cure of the otorrhœa after opening the peritonsillar abscess would make a connection between the two seem almost certain. It is true that the throat was painful only on the three days prior to the incision of the abscess, whereas the otorrhœa had lasted six weeks. Nevertheless the inflammation of the peritonsillar tissue may have been going on for a long time before the abscess developed. The peritonsillar inflammation may have begun at the time of the pharyngitis already referred to; more likely, however, it was caused later by the pus which drained into the pharynx through the Eustachian tube.

EYE-DISEASE IN RELATION TO TUBERCULOSIS
OF THE NASAL MUCOUS MEMBRANE, AND
THE TREATMENT OF THE LATTER BY
MEANS OF LACTIC ACID.¹

BY DR. V. HINSBERG, Breslau.

Translated by Dr. CARL MUND, New York.

AT a meeting of the German Laryngological Society (Heidelberg, 1899), Seifert read a paper on the relation of tuberculosis of the lachrymal canal to tuberculous disease of the nasal mucous membrane. This author found among 4200 patients in the eye clinic of Würzburg 5 cases of tuberculosis of the lachrymal canal and 9 cases of tuberculosis of the conjunctiva and cornea. In all 14 patients a tuberculous nasal trouble was present. Seifert concludes from this that tuberculosis of the lachrymal sac is almost invariably caused by a similar affection of the nasal mucous membrane, and is generally secondary. Seifert's figures, however, do not tell us in how many cases of nasal tuberculosis the extension of the disease to the eye and its adnexa takes place. To elucidate this latter question, the material of a nose clinic is more fitted.

During the six months between October, 1900, and March, 1901, we have observed 9 cases of tuberculosis of the nasal mucosa (8 female, 1 male) in the University Polyclinic for Diseases of the Ear, Nose, and Throat. Of these 9 patients, 5 showed disease of the lachrymal passages or of the eye and its surroundings, while in 4 no ocular anom-

¹ From the University Polyclinic for Diseases of the Ear, Nose, and Throat in Breslau.

aly could be found. In the first 5 cases, the etiological connection between the disease of the nose and the eye could be assumed with certainty, and the eye was always secondarily affected. In more than one-half of these cases the eye was affected, a proportion which suffices to show the great danger which nasal disease has for the eye.

As regards the kind of nasal affection, 4 of our patients suffered from a typical granulation tumor of the inferior turbinate and the septum, and in 1 there was a lupus nodule on the membrane of the turbinate. The ocular lesions were more manifold and varied in severity.

Case 1.—Tuberculosis of the nasal mucous membrane, of the soft palate, and of the epiglottis. Tuberculosis of the left lachrymal canal and left conjunctiva. Inflammatory hyperplastic changes in the right conjunctiva.

The patient, a girl of fifteen, was admitted to the Eye Hospital, October 15, 1900, on account of a lachrymal fistula on the left side. Slight hereditary taint. The patient complained of interference with nose-breathing since February. Recently her general nutrition has failed, and she has suffered severely at times from coughing.

On admission, poorly nourished, anæmic girl. Over right apex, accentuated respiration and slight dulness. In left eye, fistula in the region of the lachrymal sac and a large, round, grayish area about 1 cm in diameter, is situated in the lower, inner quadrant of the eyeball. There is an opacity with several yellowish foci in the lower part of the cornea and a number of grayish-yellow nodules around the border. In the upper part of the conjunctiva there are a number of grayish nodules, otherwise the conjunctiva presents the clinical picture of trachoma. The conjunctiva of the lids of the right side presents similar changes, but the conjunctiva of the eyeball is practically normal. The right lachrymal canal is unaffected. The nodes in the neck are enlarged on both sides.

Nose.—Breathing interfered with on both sides. On the right side, the lower meatus is filled by a nodular, partly ulcerated granulating mass, apparently originating from the lower turbinate and adherent to the septum in its posterior part. On the left side there is a similar but smaller tumor.

Pharynx.—The right faucial pillars and surrounding parts of

the soft palate are infiltrated, thickened, and pale. The surface is studded with small nodules, but without ulcerations. This lesion of the mucous membrane extends to the epiglottis.

Larynx.—The epiglottis is thickened, immobile, and covered with similar nodules. It obscures the laryngeal opening and hides the vocal cords. The patient is not hoarse, and it may be assumed that the vocal cords are not affected.

An excised portion of the area of infiltration on the left bulbar conjunctiva shows tubercular structure. Microscopically there are typical tubercular nodules with Langhans's giant cells. Transplantation into the anterior chamber of a rabbit produces tuberculosis. The pieces excised from the palpebral conjunctiva show uniform chronic inflammatory hyperplastic changes, not resembling trachoma or tuberculosis.

Local treatment of the eye with silver nitrate and iodoform salve was without much result. After four weeks the patient's general condition had improved to such an extent that energetic treatment of the nasal trouble could be begun. The granulation tumor was removed with moderate hemorrhage. Nothing was done on the left side. During the next four weeks both nasal passages were treated with lactic-acid tampons. In the middle of December, 1900, both sides of the nose were patent and the lower turbinates were of normal size. The mucous membrane was uneven, but there were no granulations. The infiltration of the right faucial pillar was diminished. During January and part of February the lactic-acid treatment was continued until no evidence of the tuberculous lesion in the nose could be made out.

The danger of fresh infection of the eye from the nose seemed now to be excluded, and on February 9th the right lachrymal sac was extirpated. It was found adherent to the surrounding tissues and the neighboring bone was carious. The walls of the sac were infiltrated with tuberculous nodules. The wound healed rapidly and was closed on March 5th. After the elimination of the lachrymal sac, the conjunctiva improved markedly. This improvement was, however, only of short duration, and in the beginning of March the infiltration again enlarged and an ulcer developed in the diseased part of the cornea. The changes in the right conjunctiva disappeared entirely, and on the patient's discharge the conjunctiva of the right eye was pale, with numerous cicatricial bands like healed trachoma.

In March, 1901, portions of the thickened epiglottis were re-

moved. The mucous membrane of the arytenoid cartilages presented a few nodules, but the vocal cords were normal. The patient then went home, and has not since returned.

This patient was an emaciated girl with tuberculous changes in the upper respiratory passages and the conjunctivæ, with slight involvement of the lungs. Before treating the eyes, it was necessary to exclude the entrance of new infectious material from the nose. The disease of the pharynx and epiglottis was probably secondary. Energetic treatment of the nose resulted in marked improvement of the nasal condition and in amelioration of the condition of the pharynx.

After extirpation of the lachrymal sac, the inflammatory changes in the right conjunctiva ceased. Treatment of the left eye, however, was without result. It is questionable whether a complete recovery is possible without sacrifice of the eyeball. The recovery of the right eye is of great interest, as it was the beginning of a specific process which was arrested by eradicating the primary lesion in the nose.

Case 2.—Tuberculous granulation tumor of the left lower turbinate. Tuberculosis of the left lachrymal sac and tuberculosis of the left conjunctiva tarsi.

C. S., twenty-four years old. No heredity. Has been under treatment at the Clinic since 1897. At that time a protruding granulating mass was removed from the tarsal conjunctiva of the left upper eyelid, presumably of tuberculous nature. The left lower lid was at that time healthy, though there existed a slight eversion of the lower puncta with a slight muco-purulent secretion. The lachrymal sac was not treated, and no mention is made of an examination of the nose. The patient returned February 22, 1901, on account of a swelling in the left lower eyelid.

On admission, well-built girl of healthy complexion. No pulmonary lesion. The left upper lid shows a notch, the scar of the old operation. The lower lid is ectropionated in its outer part by the presence of an ulcer as large as a cherry-stone. The surface is uneven and partly grayish-red, covered with grayish secretion. A narrow passage leads from this ulcer under the lid to the region of the lachrymal sac. The lachrymal passage is somewhat stenosed. Right eye is normal. The patient does not complain of

her nose, though respiration has been interfered with for some time.

On February 26th, an examination of the nose showed that the right side was normal. A granulating mass occupied the entrance to the left side. This growth was attached to the anterior half of the lower turbinate.

Diagnosis.—Tuberculous granulation tumor. The naso-pharynx and larynx presented no tubercular lesions.

As the connection between the conjunctival affection and that of the lachrymal sac was perfectly clear, the lachrymal sac was extirpated and the granulations of the lower lid excised. The tumor in the left nose was removed and showed, microscopically, typical tuberculous nodules, giant cells, but no caseation. The nose was subsequently treated regularly with lactic-acid tampons. The lachrymal wound healed primarily, and the conjunctival wound presented healthy granulations. The patient, unfortunately, had to leave on March 6th, before we could report a definite result of the treatment, though it can be assumed that a definite healing of the nasal lesion did not take place.

This was a case in a well-built, otherwise healthy individual; though the disease had existed for quite a long time—three years—the changes in the eye were not so extensive as in the first case. The case shows the intimate relation between diseases of the nose and eye and the futility of treating the latter alone. The ulcer on the left upper lid, which was treated three years ago, was surely tuberculous, just like the more recent one, which was secondary to disease of the lachrymal sac. The excision of the old ulcer was successful, but the primary focus in the nose was not treated. The transmission of the infectious material continued and produced the new ulceration in the lower lid.

Case 3.—Tuberculosis of the nasal mucous membrane of both sides. Healed left dacryocystitis. Tuberculous infiltration in the left lower lid.

F. G., seventeen years old, came to the Clinic January 28, 1901. She stated that she had suffered for some time from an eruption about the nose, and that recently the skin of the left lower eyelid had become affected.

On admission the patient was well nourished. Over right apex,

diminished percussion note; vesicular, unchanged breathing without râles. About the right nasal entrance there is a severe eczematous condition with crusts. The skin of the tip of the nose is red and thickened with a few small nodules. The lower, anterior part of the right side of the septum shows a mass of granulations covered with crusts. The right lower turbinate is similarly affected, and the left lower turbinate is covered with crusts and granulations. In the naso-pharynx, on the right side, there are a few nodules. The skin of the lower lid is thickened, reddened, traversed by rhagades, and partly covered with crusts. A few small nodules are noticeable.

The left lachrymal canal is patent. A very fine fistula leads from the left lachrymal sac to the aforementioned diseased area in the lower lid.

As the lesion in the nose is surely a primary focus, treatment of the latter is at once begun. The granulations are removed and the lactic-acid tampons are introduced. After three weeks the granulations have all disappeared and the inflammatory changes in the lower lid have improved. Further treatment was not permitted by the patient.

The nasal condition in this case is similar to that in Cases 1 and 2. The lachrymal sac was affected, though its specific tuberculous character cannot be confirmed; nevertheless, the lachrymal canal served to transmit infectious secretion, and the fistula shows the connection between the cutaneous lesion and the sac. The disease, in this case, has extended in a different manner from that in Cases 1 and 2, and the eye itself remained intact.

Case 4.—Tuberculous granulation tumor of the nasal septum. Stricture of the left lachrymal canal. Phlyctenules in the left eye.

H. T., fifteen years old, came to the Dispensary October 14, 1896. The father had suffered from syphilis, the mother was healthy. In his eighth year, the left index finger was amputated, presumably on account of a tuberculous process. One year ago vegetations were removed from his throat. The patient has been unable to breathe freely through his nose for several weeks. An hypertrophy of the posterior tips of the turbinates and an adenoid remnant were found and removed. No evidence of tubercular disease was found. The patient felt comfortable till the end of

1897, when he complained of nasal occlusion. At that time rhagades and secretions were found at the introitus nasi. The right nose was completely occluded by a nodular tumor of gray color. The tumor was pedunculated and inserted on the septum at the level of the middle turbinate. The glands of the neck were enlarged. The posterior tips of the turbinates were hypertrophied. The tumors were removed and the specimens were very suggestive of tuberculosis.

In 1898, the patient suffered from pneumonia.

On August 16, 1899, a large tumor was found in the same location as the previous one and removed.

On December 6, 1899, the tumor had recurred, and a part of the cartilaginous septum, to which it was attached, was excised.

On February 11, 1901, the patient returned with the old complaint. There is a large perforation of the cartilaginous septum with granulating edges. A tumor arises from the posterior and upper margins of the perforation. This is removed and the nose treated daily with lactic-acid tampons.

At the end of April, 1901, the edge of the perforation is smoothly healed over. The lungs are normal. The patient is being treated in the surgical clinic on account of a tuberculous focus in the left hand.

The patient has suffered from recurring inflammations of the left eye. The examination in the eye clinic showed the presence of phlyctenules. The left lachrymal canal is freely passable. The phlyctenules healed, but after two weeks pain in the left eye is again complained of. The lachrymal canal is probed and a stricture found. The patient is still under treatment.

This case is especially interesting on account of the course of the nasal lesion. It shows that the usual methods of treatment—removal of the granulating mass and cauterization—are absolutely useless. The nasal disease progressed, and not till the treatment with lactic-acid tampons was instituted did the process come to a standstill.

As regards the disease of the lachrymal canal, we have probable evidence of a beginning tuberculous lesion. The appearance of the phlyctenules is very interesting. The fact that they appeared only on the eye where disease of the lachrymal passages existed suggests a connection between these two affections. Phlyctenules, as is well known,

belong to the group of scrofulous diseases. In many cases of phlyctenules latent tuberculosis is suspected, though the eye disease itself shows no specific tuberculous properties. Our case was not a specific affection, though I think a similar connection existed as in Case I, where infected lachrymal secretion caused the disease, which, while not directly tuberculous, nevertheless belongs to the group of scrofulous lesions.

Case 5.—Lupus of the nasal mucous membrane of both sides. Healed lupus of the tip of the nose. Left dacryocystitis.

C. D., forty-eight years old, came to the clinic January 11, 1898. The patient had been treated for years in the dermatological clinic on account of lupus of the external nose. At that time examination of the nose showed a deviation of the cartilaginous septum to the right, and the mucous membrane of the lower turbinate and of the septum on both sides was covered with small nodular tumors. These were removed in a number of sittings.

In January, 1901, the patient returned, after a long absence, complaining of the formation of crusts in her nose and tears in the left eye. The condition of the lower turbinates is practically unchanged.

A small perforation has formed in the cartilaginous septum. A dacryocystitis without specific tuberculous character was present. The treatment consisted in the use of lactic-acid tampons. The lachrymal symptoms were relieved. The formation of crusts was diminished, nevertheless the nasal mucous membrane still shows a number of small nodules.

Opposed to the preceding cases, the affection did not lead to tuberculous disease of the lachrymal passages, but produced the clinical picture of a simple dacryo-cysto-blenorrhœa. It can be assumed that this was secondary to the nasal affection.

I think these five cases well illustrate the various changes which follow tuberculosis of the nasal mucous membrane.

(1) There may be some dacryocystitis (Cases 4 and 5) without any evidence of a tuberculous lesion, with symptoms of disease of the lachrymal sac. This is surely the least harmful and the one most readily treated, though, according to Seifert, it is the primary stage of severer lesions.

In these cases, the causal connection is overlooked if the nose is not examined.

(2) An evident tuberculous disease of the lachrymal sac is present (Cases 1 and 2). In none of my cases does this appear isolated, and in all cases the disease had extended beyond the lachrymal passages. Seifert was able to collect five cases of isolated affections of the lachrymal sac.

(3) The conjunctiva and the cornea are affected by the transmission of infectious material if this does not cease at a certain time (Cases 1 and 2). This may be: (a) Of inflammatory nature (Case 1, right eye; Case 4, tarsal conjunctiva of both eyes), due to irritation of the secretion, but not to the specific action of the tubercle bacilli. Manifest disease of the lachrymal passages may be absent (Case 1, right eye); (b) of specific tuberculous nature, usually in the form of infiltrations on the conjunctiva, which may extend to the cornea. The infiltrations are usually situated in the neighborhood of the punctæ lachrymales (Case 1, left eye). They may, however, be situated at some distance (Case 2, external canthus). They usually communicate with the lachrymal sac by a fistulous tract.

(4) The secretion of the tuberculous lachrymal sac may leave the conjunctiva intact, but produces tuberculous lesions in the surrounding skin of the eyelids. In all cases, fistulæ are present showing the path of infection. Three of our patients did not remain sufficiently long under treatment for me to report the results. The other four were treated and observed for a long time and have remained under observation. I think they show the possibilities of our method of treatment.

In most cases, owing to the accessibility of the anterior part of the septum and of the lower turbinate, the granulation tumors can be easily removed by a snare or thermocautery and curette. Small foci not visible to the unaided eye remain and lead to relapse. In addition to this surgical procedure, cauterizations have been tried, especially with lactic acid, which has been specially recommended in laryngeal troubles.

Jellinek, in 1885, called attention to the fact that lactic

acid must act for a certain length of time to be of benefit in the nose. This can best be accomplished with tampons which remain in place for hours. I came to very much the same conclusions from the unsatisfactory results which I had obtained by previous methods of treatment,—removal of granulations, cauterizations, cauterization with not very concentrated solutions of lactic or chromic acids—and I was induced to increase the concentration of lactic acid and the frequency and length of application. I found that tampons soaked in 80 % lactic acid could remain in the nose for three hours without causing harm or annoyance to the patient. Moreover, the tampon treatment may be continued for several weeks, though it is better during this time to vary the strength of the solution used. It seems to me of value to add iodoform paste to the acid.

It is necessary not only to apply the tampon to the diseased area, but also to the surrounding tissues. Very deep ulcerations should be treated from time to time with pure lactic acid. The result of this treatment is an unusually free mucous discharge with the formation of a thick crust, which should be kept in check by applications of boric salve.

On the day after cauterization with concentrated lactic acid (80 %) the diseased parts were found to be covered by a thick membrane; the sound mucous membrane was swollen and pale. Lactic acid does not affect the skin of the introitus if the latter is sound.

Applied to two patients suffering from lupus changes on the outer side of the nose, the disease process showed a very violent inflammatory reaction, which was quite painful, but rapidly disappeared. This confirms the well-known observation that lactic acid attacks only diseased skin and mucous membrane.

I removed the membrane daily and repeated the cauterization. In one case, where the tumor was not removed before the cauterizations, the latter being applied from the very beginning, the final result was obtained in about the same length of time as in the combined treatment. As regards the results of our treatment, we must distinguish between temporary and permanent cure. The first was excellent

in all of my cases. The granulations and ulcerations rapidly disappeared and no signs of specific tubercular disease could be found. I do not, however, think that these can be taken for permanent cures, as the results of other observers show. I would therefore like to emphasize a systematic treatment carried on over a long period of time. I would recommend, in some cases, treatment of the mucous membrane for several days in each month, even if no macroscopic lesions have returned.

Finally, it seems to me that in a patient with nasal tuberculosis, but otherwise healthy, if the nose be treated thoroughly for a sufficient length of time, the prognosis is not unfavorable. Untreated, there is danger for the patient, as the nasal secretion containing the bacilli may travel by way of the lachrymal passages to the eye and by the nasopharynx to the larynx and lungs.

REPORT OF THE TENTH MEETING OF THE GER-
MAN OTOLOGICAL SOCIETY, HELD IN
BRESLAU, MAY 24-25, 1901.

By DR. MAX GOERCCKE, BRESLAU.

Translated by Dr. RICHARD JORDAN, New York.

FIRST SESSION, FRIDAY, MAY 24TH.

CHAIRMAN: HABERMANN, GRAZ.

Business Session.

The CHAIRMAN opened the meeting at 10.15 A.M. In a brief address he drew attention to the important position that Breslau held in the history of otology, due to the skill and labor of Middeldorpf, Voltolini, Gottstein, and Jacoby, and expressed thanks to the magistrate of the city for having placed commodious quarters at the disposal of the society.

He was followed by Mayor BENDER, who welcomed the congress in the name of the city.

Councilman STEUER then addressed the meeting in his capacity as commissioner for the city hospitals. He referred to the fact that Breslau had been the first community in Germany to establish a special department for ear patients, and that, in spite of the financial burden which the acceptance of Jacoby's legacy of ten years ago had imposed upon her, she had proceeded to fully equip and maintain the department for ear, nose, and throat diseases in the All-Souls Hospital. The speaker invited the congress to inspect this department on the following day.

KÜMMEL (Breslau) welcomed his colleagues in the name of the local committee.

Speaking of the events of the past year, the PRESIDENT first mentioned the appointment of Körner (Rostock) as Professor

Ordinarius of Otology by Duke Johann Albrecht of Mecklenburg-Schwerin. A motion was made by ZAUFAL (Prag) to send an address of thanks to Duke Johann Albrecht, and was passed unanimously.

The PRESIDENT then spoke of the loss that otology had suffered in the past year by the death of Kuhn (Strassburg), praising his activity as a member of the executive committee and his successful labor for the advancement of science.

The city of Trier was selected as the place of the eleventh meeting in 1902. Thirty-one new members were admitted, the total membership now being two hundred and sixty-nine.

Kretschmann (Magdeburg) was elected a member of the executive committee. The motion made by HARTMANN (Berlin) to establish a library was passed.

Siebenmann (Basel) was elected President for the following year and Bürkner (Göttingen) Vice-President.

Scientific Session.

Addresses were made by Drs. JANSEN (Berlin) and BRIEGER (Breslau), introducing a general discussion on **otogenous sinus-thrombosis**.

I. JANSEN (Berlin): Report on our present knowledge and views on otogenous sinus-thrombosis.¹

JANSEN (Berlin) discusses first the pathological basis of otogenous pyæmia. Besides the septicly disintegrated, obstructing thrombus we have to consider the firm and solid thrombus, and the parietal thrombus. Periphlebitis also, as Jansen explains, may easily bring about pyæmic conditions, while the ordinary extradural abscess is not attended with fever. Periphlebitic abscesses need not be very large nor under high pressure to cause fever.

The speaker then dwells upon the question whether metastatic pyæmia could originate directly from an empyæma in the mastoid process, either by direct resorption of septic material or by an inflammation of the small veins (osteo-phlebitis). The speaker, formerly inclined to interpret some of his favorable cases in such a way, has gradually been led by his experience to abandon this theory. In every case of pyæmia in his own observation he has been able to find evidence of a diseased sinus. The conditions

¹ The ARCHIVES are indebted to Dr. Jansen himself for the following elaborated abstract of his address.

of the mastoid process, as well as of the dura mater, are very unfavorable to resorption. This explains why such abscesses, even very large ones, in adults are never accompanied with high fever, rarely with any fever at all — except in the first stage of an acute virulent mastoiditis. Young patients, however, react with fever more easily, and in infants and very small children the direct transition of staphylococci, etc., from a purulent mastoid focus into the blood has been repeatedly demonstrated.

Koerner has collected numerous cases from literature (about sixty), purporting to show that metastatic pyæmia could develop, without any affection of the sinus, from osteo-phlebitis alone. When we analyze his statistics critically we will find the evidence insufficient to support his conclusions. Fifteen to seventeen cases are to be eliminated in which the presence of sinus-thrombosis or perisinuous abscesses was established. In fifteen of the twenty-six cases operated on the operation was insufficiently described or not thoroughly executed. These cases fail to inform us as to the presence of a perisinuous abscess. Sixteen cases recovered without operation—a group of cases which afford ample opportunity for speculation. Yet it is evident that these cases—themselves in need of a correct explanation—are not very effective arguments. In six of the operative cases the mastoid process was found perfectly healthy. How can osteo-phlebitis originate in a normal mastoid? In other cases pyæmia set in a long time after the operation, or continued long after a negative operation. The autopsy was incompletely performed or insufficiently described in 80% of all cases. In not a single case is the condition of the jugular bulb distinctly stated,—and yet such a statement is indispensable. Thus only a paltry residue remains of the great number, and even this will not stand severe criticism. It may be noted that about 25% were due to chronic suppuration, that 25% died, and that from 20 to 25% showed metastatic foci in the lungs. It follows that the frequency of such a pyæmia cannot be ascertained from the reports of cases recorded in literature. Following Leutert's example, authors have become decidedly more sceptical in the interpretation of their cases.

In going over his own material Jansen states that in sixty-three cases of pyæmia he failed only four times to prove the presence of sinus-thrombosis. In these four cases, however, there were more or less severe perisinuous affections. Two cases of sinus-thrombosis did not present any pyæmic symptoms whatsoever; in

three there was only very slight fever; in one, high pyæmic temperature without metastases, and seven cases of acute otitis media developed pyæmia with metastatic muscular and joint affections. These ten to thirteen cases present the clinical picture of osteo-phlebitis as described by Koerner and three show still less conspicuous symptoms. But in all these cases the operation revealed positively a thrombosis of the sinus. On the other side there are three cases of severe pyæmia caused either by parietal thrombosis or periphlebitic affections. All these considerations prove that osteo-phlebitic pyæmia does not deserve the position assigned to it by Koerner. If Koerner says that pyæmia without sinus affection seems to be rarer than pyæmia with sinus-phlebitis, the speaker would rather say that if it exists at all it must be *very* much rarer and of no practical importance.

Metastatic affections of muscles and joints do not exclude—as Koerner wants us to believe—the diagnosis of sinus-thrombosis; on the contrary, they prove—according to the speaker's experience—the presence of an affection of sinus or jugular bulb. Literature as well as personal observations fail to confirm the statement that osteo-phlebitic pyæmia could be differentiated in any way from otogenous sinus-phlebitis—by its clinical course, the character of its metastases and complications, or the prognosis. Sinus-phlebitis is always easily recognized by the careful observer, while a periphlebitis of the bulb escapes our observation in all cases. We would not be justified, however, to regard the latter affection as improbable or as a non-existing stage of pyæmia. Frequently in acute otitis the bulb is in greater peril than the sinus,—as in inflammations of extreme virulence, in delayed spontaneous perforation, under favorable anatomical conditions, protruding jugular fossa with extended apposition of the bulb to the tympanic cavity, etc. In a case of severe septicæmia the speaker found the upper part of the jugular necrosed as early as on the seventh day after the first appearance of the fever and the acute influenza-otitis, while the sinus was absolutely intact. The phlebitic processes of the bulb present as a whole a graver prognosis as to the systemic infection than those of the lateral sinus; but at the same time the conditions for a spontaneous cure of the periphlebitic process are more favorable on the bulb than on the sinus—presumably on account of the rapid improvement in the intratympanic inflammation. In all cases of pyæmia where the sinus appears healthy, particularly in acute otitis, our first thought

must be of a phlebitis of the bulb. In the speaker's own material, with a preponderance of acute otitis at the ratio of 16:11, primary phlebitis of the jugular bulb is the more frequent.

LIGATION OF JUGULAR VEIN.

In parietal thrombosis and in obstructing thrombi that have not yet disintegrated spontaneous healing is possible after evacuation of the perisinuous collection. Observations of this kind are very numerous. If the thrombus is disintegrated, however, its elimination has to be attempted by incision of the sinus, or by ligation of the jugular vein, or by both operations combined. Judging from the reports published, the ligation of the jugular vein in pyæmia shows better results than operation on the sinus alone. In the synoptical report by Viereck of ninety-four cases in which no evidence was present of an affection of the jugular vein forty were ligated and fifty-four were operated only on the sinus. Of the forty ligated cases six, *i. e.*, fifteen per cent., died, and of the thirty-four that recovered six developed metastatic complications. Of the fifty-four cases operated on the sinus, thirteen, *i. e.*, fourteen per cent., died. Of the forty-one cured cases sixteen had long-continued pyæmic fever, eleven had metastatic abscesses. The numerous recoveries after incision of the sinus alone certainly go to prove that ligation is frequently unnecessary. The speaker's opinions about the different operations and their indications may be tabulated as follows :

Ligation of the jugular vein is done

- I. As the *first step* of the operation
 1. in undisputed cases of jugular phlebitis ;
 2. in severe sepsis (or septicæmia).
- II. After *exposure* of the sinus
 1. if the sinus appears healthy with no perisinuous affections, where the pyæmia shows rigors and marked oscillations of temperature ;
 2. in periphlebitis and parietal thrombosis under the same conditions.
- III. After *incision* of the sinus
 1. if the septic thrombus is or was situated in the immediate neighborhood of the bulb ;
 2. if, after the incision, the rigors do not cease, nor the temperature decrease materially.

The sinus is *opened*

1. at the evidence of a septically disintegrated thrombus ;
2. in gangrene of the sinus wall ;
3. in repeated rigors, marked oscillations of temperatures, and poor general condition ;
4. neuritis optica.

The evidence of an affection of the sinus wall or of a solid thrombus does not necessarily call for an operation on the sinus or jugular vein, for these affections very frequently recover spontaneously. The character of the systemic infection is an essential factor.

The co-existence of a diffuse purulent meningitis is at the present time a contraindication to sinus operations. The mere evidence, however, of pus or cocci at the lumbar puncture should not deter us from operating.

Agreeing with von Bergmann, but disagreeing with Leutert and others, Jansen rejects the incision of the sinus for therapeutic reasons, and particularly for diagnostic purposes as long as a good current of blood is circulating through the vessel. Accordingly, he prefers the puncture to the incision, although the puncture is convincing only in the case of a positive result. Whiting's method of ascertaining by digital compression whether the bulb is thrombosed or not is declared permissible, but neither advisable nor reliable.

Guided by the principles, as stated above, not to ligate the jugular vein immediately in every case of pyæmia where we find only a perisinuous abscess or a parietal thrombosis, and not to ligate at all in cases where the circumscribed focus in the sinus can be thoroughly exposed, Jansen has attained the following results in the last years :

25 cases of sinus or jugular thrombosis				
with.....	3 fatal = 12 %	and 22 recov. = 88 %		
of which 3 were operated on mastoid only —		3 "		
" 22 " on sinus or jug-				
ular vein.....	3 fatal = 13.6 %	" 19 "	= 86.4 %	
of the latter 10 on the sinus only	—	10 "		
" 12 on jugular vein and				
mostly on the sinus.....	3 fatal = 25 %	" 9 "	= 75 %	

Of the ten cases operated on the sinus, all recovered without the fever continuing after the operation for any length of time.

Altogether, Jansen has performed and partly reported :

50 operations on sinus or jugular vein with.....	35	recov. = 70 %
of which 30 on sinus alone "	22	" = 73 %
" 20 on jugular vein and sinus "	13	" = 65 %

2. BRIEGER (Breslau). **Report on the present status of otogenous pyæmia.** The pathogenesis of otitic pyæmia varies in different cases. Usually, there is a thrombo-phlebitic process in the lateral or sigmoid sinus or in the jugular bulb, but cases do occur where in undoubted otogenous pyæmia all the sinuses show a normal condition. In two such cases of Brieger's the metastatic foci were so recent that recovery of the sinuses from the thrombo-phlebitic process was not to be thought of.

Pyæmic symptoms (fever, metastases) may originate directly from the ear by the formation of bacterial emboli. Osteo-phlebitis, however, can no longer be sustained as a special clinical form of otitic pyæmia. The pyæmic symptoms, in cases where at the operation the sinus appears normal, are frequently accounted for by a parietal thrombus.

Etiology: Most frequently streptococci are found; occasionally the staphylococcus, the pneumococcus, and Friedländer's bacillus. The number, distribution of germs, and their virulence within the thrombi vary considerably. The virulence does not always correspond to the severity of the pyæmic symptoms. Sometimes the dissemination of thrombotic particles leads to simple infarcts, sometimes to the formation of metastatic abscesses. The pyæmic symptoms may exacerbate and new metastases may occur after an interval of weeks and even months.

Diagnosis: As high temperatures for several days are occasionally seen in uncomplicated suppurations, the diagnosis of otogenous pyæmia or sinus-thrombosis cannot be made on the strength of such a symptom. Only the typical pyæmic temperature chart is conclusive, although in undoubted pyæmia it may change considerably, and even be completely absent.

The speaker then discusses the examination of the exposed sinus before and after incision; he calls attention to the importance of carefully inspecting the internal wall, and reviews the different methods for rendering the affected portion of the sinus bloodless.

Treatment: The operation for sinus-thrombosis is contra-indicated only where the general condition of the patient prohibits surgical treatment (as in severe diabetes). The object of the operation is the occlusion of the sinus peripherally and centrally.

Hence the removal of the firm ends of a thrombus is not advisable. The method frequently employed in parietal thrombosis to ligate the jugular vein, transforming the parietal into a complete thrombosis and afterward incising the sinus, is open to objection and not free from danger. The ligation of the jugular vein to prevent the dissemination of infected particles is frequently unnecessary, because a firm adhesion of the walls takes place between the lower end of the thrombus and the next tributary vein; sometimes it is harmful, because it causes the thrombosis to expand over portions of the venous system previously unaffected. If the phlebitis spreads to the jugular vein, however, the ligation of the latter is the only reliable way of preventing the downward extension of the phlebo-thrombosis. Ligation should be followed by the splitting of the portion between the ligatures.

Demonstration of fever charts, specimens, and drawings of sinus-thrombosis.

Discussion: KOERNER (Rostock) admits that osteo-phlebitis is rarer than he had formerly thought it to be, but he insists on the possibility of pyæmic fever and peripheral metastases caused merely by a disease of the bone. A larger number of reliable clinical and anatomical observations will enable us in due time to decide this much disputed point.

LEUTERT (Königsberg): The practical importance of osteo-phlebitic pyæmia is infinitely small. If the autopsy in a case of pyæmia fails to reveal sinus-thrombosis, a microscopical examination of the different sinuses should be resorted to. Leutert believes that we would rarely err in diagnosing sinus-thrombosis in adults, where a continuous fever exceeds 39° C. (102° F.) for several days; in such cases we must needs be guided by somewhat diagrammatic rules; besides, these very cases with a continuous high temperature are most dangerous. Leutert does not recognize the possibility of a non-infected thrombus. If in pyæmia a thrombus has been found, it should be removed, even though we may not be certain of its being the cause of infection. If fever is present after the *acute* inflammatory symptoms have passed, the sinus has to be exposed, even when the morbid changes found in the mastoid bone are very slight. Leutert is opposed to the assumption that thrombosis of the jugular bulb could originate directly from the adjoining tympanic cavity; he believes that the thrombus formation always starts from a place where the pus finds no outlet—that is, at the sinus.

Regarding **the ligation of the jugular vein**, Leutert now thinks that it ought to be done in every case of sinus-thrombosis and prior to the operation on the sinus, as it is impossible to foretell when the dissemination of the thrombus will occur. If there are indications that the thrombus extends beyond the facial vein, the jugular ligation should be done below, otherwise as high up as possible. Incision of the sinus is to be preferred to the puncture; profuse hemorrhage might necessitate a delay of one to two days. In opposition to Brieger, Leutert denies that packing could produce obstructing thrombosis.

PANSE (Dresden) relates a fatal case that would have been taken for osteo-phlebitic pyæmia if a diligent search had not discovered a disintegrated thrombus in the bulb. Panse regards the direct infection of the bulb from the tympanum as very probable.

HABERMANN (Graz) cites a case described by him in the *Handbuch für Ohrenheilkunde* where, in spite of a large perforation in the drum membrane, the jugular bulb was found diseased.

DENKER (Hagen) mentions a case of **influenza-otitis** where fever and pain in several joints set in on the seventeenth day of the otorrhœa. After several metastatic abscesses in shoulder and thumb were incised, the fever disappeared. Denker is inclined to interpret his case as one of osteo-phlebitis.

HOFFMANN (Dresden) states that in his case, referred to by Jansen, the diagnosis of thrombo-phlebitis was made and the ligation omitted on account of alarming symptoms owing to the narcosis.

ALT (Vienna) agrees with Jansen that the ligated portion of the jugular vein should be excised, and mentions a case where the secondary infection of the ligated jugular vein was followed by the formation of a perijugular abscess.

SCHEIBE (Munich): There is no doubt that isolated thrombosis of the jugular bulb occurs in acute otitis media, and more particularly in influenza-otitis; the influenza bacillus is very apt to affect the blood-vessels and to cause necrosis. Scheibe relates a case of bulbo-thrombosis in his practice.

VON WILD (Frankfort-on-the-Main) thinks that the speakers have exaggerated the importance of sinus-thrombosis as the principal cause of otogenous pyæmia. He considers it more correct to speak of an otogenous blood-infection, comprising bacteræmia, toxæmia, and pyæmia. In opposition to Leutert, who identified sinus-thrombosis with pyæmia, Von Wild has no doubt that pyæmia can

develop without thrombosis, analogous, *e.g.*, to the development of septicæmia in tonsillitis ; besides, it is possible experimentally to produce pyæmia by injection of bacilli. Thus otogenous pyæmia might be explained by a direct absorption of pus from the ear, especially in cases where the pyæmic symptoms appear early. In case of an early operation, therefore, the evacuation of the primary focus will be sufficient ; if, in spite of this, the infection should progress, it will be time enough to then operate upon the sinus.

PREYSING (Leipzig) regards bulbo-thrombosis not as rare as Leutert does, but thinks that, owing to its situation, it is frequently overlooked. Leutert's argument for ligation prior to the sinus operation because of a suppuration of the jugular stump in one of his cases does not seem well founded, as the ligation in most cases of sinus-thrombosis leads to an infection of the stump. A certain routine is indispensable, but Leutert goes too far in declaring that the rise of temperature above a certain limit is conclusive evidence of the presence of sinus-thrombosis. On the other side, Leutert himself concedes that sinus-thrombosis occurs without fever. Preysing distinguishes three forms of thrombi: (1) The solid, organized thrombus, frequently without fever. Here the ligation of the jugular vein would be unwarrantable. 2. The thrombus disintegrated in the centre and solid at both ends. In this case we may wait with the ligation unless the fever continues or sets in after the sinus operation. 3. The thrombus extending into the jugular vein. Here the ligation is indicated and should precede the operation on the sinus. Preysing ligates in the middle of the neck, where surgeons ligate the carotid ; he ligates the facial vein separately (and the ligation of the external jugular should not be omitted.—ED.).

Cases are reported by EHRENFRIED, SCHWABACH, WALLISEK, DEUTSCHLÄNDER.

JANSEN, in the discussion, said that he was pleased to see that the differences of opinion on this subject had largely disappeared. He agrees with Leutert that the cases with a continuous high temperature are especially severe ; but in these cases it is difficult to exclude meningitis (not even the presence of cocci in the spinal fluid, as elicited by lumbar puncture, being sufficient evidence of the presence of an incurable meningitis).¹

That injury to the sinus is not without danger is shown by a case in Jansen's practice where such an injury to the healthy

¹ See paper by Jac. Cohn in this number.—ED.

sinus was followed by fatal pyæmia. While Leutert pleads for ligation in every case, and for the removal of every thrombus, Jansen thinks it first necessary to prove that the thrombus is an infected one, for thrombosis could develop without the immigration of cocci. The principle of surgery, to avoid everything unnecessary, should never be lost sight of. If a solid thrombus is not accompanied by fever, an operation is not indicated; such cases recover without sinus-operation. He must differ from Leutert's opinion, that all thrombi of the bulb originate in the sinus. The bulb is frequently separated from the tympanum by an extremely thin bone wall, and cases with gravitations at the bulb are by no means rare. Jansen is not inclined to abandon the exploratory puncture of the sinus; he is not at all convinced that it could be dispensed with, and he denies that it leads to diagnostic errors. As to the technique of ligation, Jansen agrees with Preysing.

BRIEGER (in closing the discussion): Leutert will hardly be able to uphold his absolute opposition to otogenous pyæmia without thrombosis. Cocci can enter the circulation from the ear as well as from other parts of the body. This has been confirmed by experimental investigations. The two cases mentioned by Brieger in his paper will be reported in detail. They are above criticism. Under certain conditions the diagnosis is very difficult; our knowledge of the clinical symptoms and their significance is in need of further advancement, as on this subject no aid is to be expected from bacteriology. Brieger considers the routine practice, advocated by Leutert, as directly harmful; it would lead to an unnecessarily frequent exposure of the sinus, and such exposure is never without danger. That the ligation of the jugular vein may facilitate the progress of the thrombosis is illustrated by some striking observations in Brieger's practice, which have the value of physiological experiments. In one case, the jugular vein was found patent at the time of its ligation; and at the post-mortem, forty-eight hours later, the whole vein was filled with thrombi. It is not possible to produce a thrombus by an incision of the sinus, but the introduction of a tampon into the sinus invariably leads to thrombosis.

SECOND SESSION, MAY 24TH, 2.30 P.M.

3. ALT (Vienna): **Musical hearing and its impairment.**

Alt has made a number of experiments to ascertain to what

extent the musical hearing may be impaired by disorders of the sound-conducting apparatus. He tried to bring about those conditions of the ear which present themselves when the drum membrane is pressed inward (as in middle-ear catarrh). With a Siegle's speculum he forced air into the external meatus and tested the perception of the sound of tuning-forks transmitted by bone-conduction (to insure a uniform duration and intensity of vibration the forks were excited by electricity).

He found that the tone of a fork of 32 v. d. ceased to be heard, but that an overtone (harmonic) of varying pitch was heard (32, 196, or 280 v. d.). If the pressure in the meatus was increased, the overtone disappeared also upon application of a fork of 64 v. d., the twice-marked octave (256 v. d.) (C²) appeared, to disappear again with increased pressure. When two forks were applied simultaneously (32 and 256 v. d.), the lower tone disappeared, the higher one was diminished. The experiments show that even a moderate inward-pressure of the tympanic membrane may considerably impair tone perception. The question arises, whether the diminished perception of the lower tones is due to great tension of the chain of ossicles—*i. e.*, to impaired sound-conduction or to a change in the hydrostatic pressure in the labyrinth caused by the sudden inward-pressure of the footplate of the stirrup. The latter assumption is correct, for at high pressure the perception of the overtones also disappears, the ear becoming totally deaf. A moderate increase of the intralabyrinthine-pressure paralyzes certain fibres of the membrana basilaris so that low notes cannot be heard. As to the function of the chain of ossicles, Alt favors Zimmermann's supposition that it constitutes a damper and regulator of the intralabyrinthine pressure. The regulating apparatus fails to work properly in middle-ear diseases, and every loud sound transmitted produces—as in the experiment—an increased pressure in the inner ear. The weight of an exudation against the round window also increases the pressure in the labyrinth; in the same way contraction of the tensor tympani muscle diminishes the hearing of deeper tones. In addition, Alt explains the conditions which cause diplacusis, and relates in detail a case of diplacusis in a musician.

Discussion: DENNERT, BERTHOLD, PANSE, EHRENFRIED.

4. DEUTSCHLÄNDER (Breslau): **Demonstration of a case of purulent otitis media with parotid-abscess, extradural abscess on the lateral sinus and on the jugular bulb, gravitation abscess into the atlanto-occipital joint.**

Some time after a radical operation, Deutschländer's patient showed symptoms of an inflammation of the labyrinth. As the ear continued to discharge, the sinus was exposed and a perisinuous abscess found. The whole mastoid process was removed with exposure of the facial nerve. On pressure against the infiltrated jugular region, pus appeared in the wound from the direction of the bulb. Deutschländer, in order to evacuate the abscess thoroughly, entered deep into the fossa pterygo-maxillaris, reaching the spinal column after the removal of a part of the occipital bone.

Patient recovered.

5. L. WILLIAM STERN (Breslau) : **Demonstration of a continuous bottle-tone series.** This apparatus, originally designed by Stern to demonstrate the sensibility for tone-differences, seems well adapted to serve as a substitute for the continuous fork-series from which it is distinguished by the following qualities : 1. It is in reality a continuous tone-series which can be run through, from one end to the other, without interruption from one tone to the other. 2. All tones can be produced, which differ only by a single vibration or even a fraction thereof. 3. Every tone can be sounded for any length of time and with an even intensity. 4. Even the deep tones are distinctly heard throughout the testing room. At present the apparatus covers only the tone-range from 100 to 1000 vibrations, but this is the region containing Bezold's "sixth," which is considered practically so important. Its limits may be extended later. The tone is produced by the blowing over bottles with a pair of bellows ; its variation, by the rise and fall of water from below, regulated by a special contrivance. The speed of the tone-variation is in proportion to the speed of the revolutions of a crank which controls the rise and fall of water in the bottles.

Discussion :

BERTHOLD : An advantage of this apparatus is the uniform intensity of the tones produced. In weighted forks the tones become more feeble when the weights are lowered. The difference in the intensity of tuning-fork tones is very considerable.

DENKER (Hazen) : The apparatus will not be of great practical value before the upper and lower tone-limits will have been added to it. Besides, the tones do not seem to be free from harmonics. Have they been tested in this direction ?

STERN : No; but Helmholtz and Stumpf have authoritatively

stated that these bottles give tones free from harmonics. These, if present at all, are so feeble, that they can be neglected for all practical purposes.

PANSE (Dresden): The apparatus is well adapted to determine whether higher tones are heard better than lower ones.

DENNERT (Berlin) thinks that a continuous tone-series could be constructed more easily and more economically by means of sirens.

STERN: Sirens are very rich in overtones and therefore not appropriate for testing purposes.

6. PETER (Breslau) and HINSBERG (Breslau): **Demonstration of plate-models to illustrate the development of the nose of vertebrate animals.**

The models are made after Dorn's method of plate-modelling.

7. BERTHOLD (Königsberg): **Demonstration of an apparatus for the vaporization of the nasal mucous membrane.**

With this apparatus (made by Hahn and Loechel in Danzig) temperatures exceeding 100° C. can be generated. Its application produces a fibrinous exudation of the mucous membrane, and a new healthy membrane forms in the place of the destroyed one. According to the effect either of the escaping steam or of the heat only the treatment is called *Atmocausis* or *Zestocausis*.

8. SCHEIBE (Munich): **Demonstration of a knife for the removal of the hyperplastic ridges in lateral pharyngitis.**

A blunt-pointed bistoury with a short blade, bent slightly on the flat. While an assistant depresses the patient's tongue, the lateral ridge is grasped with a forceps and cut off from above downward.

9. KAYSER (Breslau): **Demonstration of an unusually large tonsillar calculus.**

The concretion was removed from a boy twelve years old; it was the size of a large olive.

10. KAYSER: **Demonstration of a patient with an ulcer of the external meatus.**

The ulcer is located at the junction of the cartilaginous and osseous meatus and is walled in by thickened edges. In the secretion tubercle bacilli were found.

11. BRIEGER (Breslau): **Demonstration of a patient with primary tuberculosis of the petrous bone.**

Girl, eight years of age, showed symptoms of an empyema in the mastoid antrum while the tympanum was always free from secretion. *Operation*: Antrum and mastoid cells filled with gran-

ulations. The latter had penetrated the tegmen to the dura, covering it in a thick layer. Microscopical examination of the granulation-tissue showed numerous tubercles with cheesy degeneration. The ear has recovered completely.

12. BRIEGER: **Demonstration of an anatomical specimen from a case of labyrinthitis.**

Sudden deafness after influenza-otitis. A few months later, death from tubercular meningitis. Microscopic examination reveals a complete destruction of the nervous structure by the formation of osseous and cicatricial tissue in the cavities of the labyrinth.

13. GOERCKE (Breslau): **Lantern demonstrations.**

a. Two cases of fibro-sarcoma of the auditory nerve with atrophy of the nerve fibres of the ganglia in the canalis spiralis and of Corti's organ.

b. Histological pictures of aural polypi.

Discussion:

KÜMMEL (Breslau): What Goercke demonstrated as glands in one of his sections are not glands, but depressions of the epithelium. The existence of glands in the tympanum is very doubtful.

GOERCKE: When the depressions of epithelium subdivide and widen, when they show a separate fundus and duct, when—above all—mucus-secreting cells appear in the fundus,—in short, when they show all the characteristics of glands, they have to be regarded as such. Glands have been found in the tympanum by von Troeltsch, Wendt, Krause, Politzer, and others. Goercke considers the presence of glands in his specimens as indisputable.

HABERMANN (Graz) asks whether in the case of follicles in an ear-polyp general lymphomatosis had been present.

GOERCKE: No. The polypus was located in the region above the membrana tympani where follicles in the normal mucous membrane have been found by W. Krause and Nassiloff.

14. KÜMMEL (Breslau): **Lantern demonstration** of a section showing the progress of middle-ear inflammation through the bone toward the sinus caroticus.

End of session 4.30 P.M.

THIRD SESSION, MAY 25TH, 9.15 A.M.

15. PANSE (Dresden) reads the report of the commission on notation of hearing tests.

16. DENKER (Hagen): **The ear of the Monotremata from a phylogenetic point of view.**

BONE : In opposition to Sixta's statement Denker has found that the monotremata do not possess an os quadratum ; he is also convinced that the fenestra ovalis is enclosed entirely by the petrous bone, while Sixta places the vestibular opening in the suture of the oto-sphenoid and pleuro-occipital bones. Denker contradicts the same author's statement that the monotremata had the same osseous labyrinth as the sauria. Denker found no sutures in osseous labyrinth and believes it to be encased by a single bone, the os petrosum. The *cochlea* is somewhat similar to the saurian cochlea inasmuch as it is less convoluted than in any mammal. The presence of Corti's pillars and Corti's canal, however, reminds one of the mammalian cochlea. Denker found a lamina spiralis only in echidna, not in ornithorhynchus. *External Ear :* both representatives of the monotremata lack an osseous meatus but possess an auricle, though in the most simple form possible, thus showing the same development of the external ear as the mammalia. (The sauria have no external ear.) The *membrana tympani* consists of three layers (the sauria have no membrana propria) and is divided into the pars tensa and the pars flaccida ; the latter, in echidna, is composed of muscular elements. The membrane is stretched in an annulus tympanicus which is attached to the petrous bone by connective tissue. There are three *ossicles*, but their form and connection remind one of the saurian columella. Malleus and incus are so firmly connected by syndesmosis or synchondrosis that they act as a unit. The place of the stapes is taken by a columella fixed into the vestibular opening by connective or cartilaginous tissue. Instead of the *tympanum* there is only a shallow groove in echidna (*fossa tymp.*) ; in ornithorhynchus even the osseous frame of the median wall of the tympanum is missing. Both representatives of the monotremata have no stapedius muscle, like the sauria, but they possess a m. tensor tympani, which is found in mammals exclusively.

Eust. Tube : In ornithorhynchus a broad communication exists between pharynx and tympanum ; in echidna there is a cartilagino-membranous tube. This form is occasioned by the mode of life of the ant-eater, which causes a prolongation of the palate and a backward displacement of the naso-pharynx. A crista vestibuli is found in echidna only, a fossa subarcuata in ornithorhynchus only ; a meatus acusticus int. only in the former,

the latter having but a shallow fossa auditoria. *Résumé*: The organ of hearing of the monotremata, on macroscopical inspection, bears some resemblance to the ear of the sauria, but, as a matter of fact, is closer related to the mammalian ear.

Discussion: BERTHOLD, DENKER.

17. BÖNNINGHAUS (Breslau): **On the anatomy and physiology of the whale's ear.**

It is a phylogenetic fact that the ancestors of the whale were terrestrial mammals. Hence, it is interesting to investigate what changes the ear of the whale has undergone in the course of time by its adaptation to an aquatic existence. Bönninghaus has examined the ear of *Phocæna communis* on seven individuals (including one embryo).

18. BIEHL (Vienna): **On the origin and course of the vestibular nerve.**

Biehl selected sheep and horses as subjects for his investigations, because the nervus vestibularis in these animals is entirely separated from the n. cochlearis. Later Biehl confined his experiments to sheep, as the horses did not survive the operation long enough. Biehl exposed the occipital lobe and lifted it up; then the tentorium and the transverse sinus lay open for inspection. The hemorrhage was always quickly stopped by tamponing. Mechanical irritation of the vestibular nerve caused nystagmus and rolling movements. Then the nerve was divided. The animals, which always recovered quickly from the operation showed, pronounced disturbances of the equilibrium. On sections of the removed cerebrum Biehl traced the course of the nerve (Marchi's stain) from its origin to its exit.

19. DENNERT (Berlin): **Acoustic investigations on simultaneous tones and Helmholtz's theory on tone-sensation.**

In experimentally investigating the laws governing the transmission of sound from one sounding body to another, it must first be well understood that it makes a great difference whether the two bodies to be excited for sympathetic vibrations are equally (or nearly equally) tuned, thus having the same specific irritability, or whether such a relation is not present. Bodies of the same specific irritability excite one another to sympathetic vibration by comparatively small intensities of sound. Disregarding their physical qualities, their irritability, and the degree of damping,—conditions of importance for the phenomenon of co-vibration,—it is first necessary to distinguish whether the two bodies are in

the same medium, or each in a different one, *e. g.*, one in air, the other in water. *Ceteris paribus*, bodies in the same medium are easily excited to co-vibration. If one body is suspended in air, the other in water, sympathetic vibration is more difficult. The influence of water on the vibration of bodies has to be determined; on this very different statements have been made. Dennert found that sympathetic vibration between sounding bodies in different media takes place when they are adequately tuned, *i. e.*, when both, influenced by their respective media, show the same number of vibrations. With tuning-forks thus adequately tuned, Dennert could demonstrate sympathetic vibration of the one in water excited by the one in air.

When the two forks were connected by a solid conductor, the experiments showed that no auxiliary apparatus was necessary to bring about co-vibration. It was important, however, to find a way of adjusting the experimental apparatus which would insure a better communication of sound from air to a fluid medium. Dennert's apparatus shows a striking analogy in principle as well as in its external arrangement to the mechanism of the middle ear. This fact, that acoustic experiments led to an arrangement analogous to the sound-conducting mechanism of the ear, while Helmholtz, inversely, deduced from the anatomical arrangements of the middle-ear apparatus its cardinal physiological importance, is an argument in favor of Helmholtz's hypothesis. The acoustic experiments have also demonstrated that an auxiliary apparatus is unnecessary to excite resonators in fluid media by solid conduction (analogous to bone-conduction), while such an apparatus is advantageous for the transmission of sound by air-conduction to fluid media and to resonators suspended therein.

Discussion. — KAYSER (Breslau): The salient point of the problem has not been completely solved by Dennert's experiments. Dennert transmits the vibrations of the fork in air to the one in water by direct contact. This would be analogous to the stapes being in direct contact with the membrana basilaris; both, however, are separated by fluid. The difficulty is in the transmission of vibrations from air to a fluid medium. We know that this involves a considerable diminution of sound, and the question is how, in spite of this diminution of sound, the ear is capable of such an extraordinary acuity of hearing. On the whole, Dennert's investigations have considerably advanced our knowledge.

SCHMIDT (Leipzig): Dennert's experiments are analogous to

the conditions in the ear, as the transmission of vibration from the stapes to the basilar membrane is particularly direct.

ZIMMERMANN (Dresden): Since the experiments by Johannes Müller the chain of ossicles has been regarded physiologically as a columella. From recent investigations, however, it appears that the ossicles represent merely a damping apparatus.

PANSE (Dresden): The experiments referred to by Zimmermann should be accepted with reserve.

DENNERT admits that the problem is still far from being solved, but believes that his experiments have brought us a step nearer to its solution.

20. PANSE (Dresden): **On vertigo.**

Panse describes the nerve course through which we are informed as to our relations in space, and explains how illusions about these relations occur, and the sensation of vertigo.

Discussion: BERTHOLD (Königsberg) relates the case of a man who, when walking in the street, made a revolving motion after every third or fourth step, turning twice around his axis. The symptom was said to have appeared after an operation.

THOST (Hamburg): The phenomenon "vertigo" has been made a subject for discussion by the Congress of Physicians and Scientists of 1901, to be held in Hamburg.

21. BERTHOLD (Königsberg): **On the origin of entotic noises.** Berthold constantly hears a tone (c^3) in his left ear. Usually entotic tones are indications of a pathological condition of the ear. Until 1884 Berthold's ears did not trouble him; then after the development of a pharyngeal and tubal catarrh with autophony and impairment of hearing, noises appeared in the left ear. Aside from the high tinkling of f^3 , which is not uncommon in healthy ears, Berthold heard a seething noise, and further, when shaking his head, a high, loud tone (c^3) as sounded from a bell, occurring with every jerking movement of the head, and instantly ceasing when the movement was stopped. If the auditory meatus is partially closed with the finger, small vibrations of the drum-membrane produced by the moving finger have no effect, but the tone (c^3) is heard as soon as the meatus is completely closed and the movements are made with the finger. The symptom appears also in walking and at night after hard work, then corresponding to the pulse-beat. Berthold thinks the tone is produced by certain parts in the ear being set in motion by shaking, and he suspects a relaxation of the joints between the

ossicles. The relaxation is probably only slight, otherwise a noise and not a simple tone could be expected. The tone becomes synchronous with the pulse when mental labor causes a hyperæmia of the head and ear.

Discussion: SCHMIDT (Leipzig) recommends for the suppression of a tone caused by hyperæmia the application of an ice-bag to the neck.

22. HABERMANN (Graz): **On the pathogenesis of deaf-mutism.** Habermann restricts himself, to save time, to the demonstration of his specimens. The first one is taken from a seventy-three-year-old deaf-mute. Left drum-membrane shows perforation and calcareous deposits, the right also residua of middle-ear suppuration. Ankylosis of the stapes by connective-tissue formations and hyperostosis of the bone; foramen rotundum is closed by osseous tissue. Head of malleus and incus are fixed to the lateral wall of the attic by connective tissue. The deafness in this case is due to the ankylosis of the stapes and the closure of the foramen rotundum, as far as a cerebral cause can be excluded (cerebrum was examined microscopically). In the second case the round window is closed by hyperostosis, while the foramen ovale is intact. In this case the deafness was not absolute.

23. SCHEIBE (Munich): **Otitis of the labyrinth capsule.** In otitis of the labyrinth capsule, which constitutes the principal pathological basis of sclerosis, there are, as Scheibe believes, with Politzer and Siebenmann, no material changes of the mucous membrane present, except in small isolated places over the ostitic foci. Habermann, however, thinks that in all these cases the mucous membrane was formerly inflamed, but had become normal again. One of the cases examined by Scheibe is that of a girl of twenty, with chronic suppuration, perforation of Shrapnell's membrane, and cholesteatoma. Three weeks previous to her death she became totally deaf in the diseased ear. At the post-mortem an intense inflammation was found in the cochlea and a fistula of the semicircular canal. The tympanum showed the signs of a chronic inflammation. Microscopical examination of the bone: Newly formed bone tissue at the horizontal semicircular canal and on the crura and foot-plate of the stapes. In the labyrinth capsule, just above the oval window, is an ostitic focus the size of a pin's head, protruding toward the tympanum. These foci consist of osteoid tissue; the surface of the newly

formed bone shows lacunar erosion; the cartilaginous layer at the foramen ovale has entirely disappeared. Apparently two different processes have been active simultaneously: first, a solidification of bone by the increase of the osseous tissue in the diploic interstices, and, secondly, an increase of the spongy tissue at the expense of the bone. The latter process has been named by Siebenmann, rarefaction (*Spongiosierung*) of the labyrinth capsule¹; it takes place largely, as Siebenmann states, at the foramen ovale. Habermann found similar changes in chronic suppuration, and regards them as sequelæ of the middle-ear inflammation. In some of those cases where the deafness increases after the suppuration has subsided, the progressive diminution of hearing may be due to a "rarefaction," which can lead to an ankylosis of the stapes. Scheibe's second case was one of scarlatina-otitis, with residua of otitis interna. Here also a rarefaction of the labyrinth capsule was found. On the promontory, below the foramen ovale, was a focus with dilated medullary spaces. The otitis was probably caused by the otitis interna. Scheibe's cases confirm the statement of Habermann that the same affection of the bone, as in sclerosis, can occur in chronic suppuration of the middle ear and perhaps in otitis interna.

Discussion: HABERMANN is pleased to have his investigations of ten years ago confirmed by Scheibe. He mentions a case (twenty-eight-year-old imbecile, who died from eclampsia) where he found the same changes as Scheibe. In his opinion the process in the bone (*ostitis chronica*) originates in an inflammation of the tympanic mucous membrane. The ostitic foci are nearly always located near the fenestræ; a rare location is that in the internal auditory canal. He has never found any isolated foci on the semicircular canals.

SCHEIBE does not believe that the otitis in sclerosis is always caused by an inflammation of the mucous membrane. This is made improbable by the frequency of bilateral sclerosis, which exceeds the frequency of bilateral middle-ear inflammation, and further by the gradual progress of the otitis in absence of inflammatory symptoms.

PANSE emphasizes the constitutional element in this condition. The rarefaction of the bone is similar to the changes in

¹ See Siebenmann's excellent article with six beautiful plates on this subject, in these ARCHIVES, vol. xxix., p. 157, 1900.—ED.

osteomalacia after parturition. Panse mentions the relationship between puerperium and sclerosis.

HABERMANN insists that the origin of the disease is in the mucous membrane, which always shows histological changes even though the inflammation may not be recognizable by clinical symptoms.

24. GOERCKE (Breslau): **On caries of the ossicles.** The morbid anatomy of caries of the ossicles has been studied almost exclusively on specimens from operations. Such material, however, is too one-sided to throw sufficient light on the pathology of ossicular caries. The latter is usually too far progressed and the important initial stage is rarely observed. The development of the carious process can be studied more successfully on post-mortem specimens. Goercke has examined a large number of such ossicles. The specimens were first inspected in normal salt-solution with the stereo-microscope; they were photographed in the case of visible changes and then prepared for microscopic examination. Caries of the ossicles usually begins with a periostitis, but Goercke repeatedly saw specimens where in severe otitis media the medulla was primarily affected, the periosteum presenting no changes. While usually the inflammation spreads from the periosteum through the Haversian canals toward the medulla, occasionally a primary osteitis will occur and spread through the same channels toward the surface. Cases of caries which had healed spontaneously were comparatively numerous. The final result of the healing process varies considerably: it is either a shallow groove covered with a nearly normal mucous membrane, or the defect filled in with cicatricial tissue, or a new formation of bone has taken place from the periosteum (exostosis, hyperostosis). If the same process is active on the tympanic walls, it can come to an osseous fixation (adhesion) of the ossicles. The medullary foci also heal up spontaneously by the formation of cicatricial or osseous tissue, the latter resulting in a partial or total eburnation of the bone. Localization: the investigations confirmed the generally accepted opinion that the long process of the incus is most frequently affected, the hammer less frequently than the incus, the manubrium less frequently than the head of the malleus. But in several cases the very parts which are supposed to be rarely affected were found to be diseased exclusively, as the neck of the hammer, the articular surfaces, the body of the incus with intact processes. The otoscopic picture does not always give a reliable

intimation as to the location of the disease, although characteristic pictures, as tabulated by Leutert, may be relied upon in the majority of cases. The perforations at the upper pole which are supposed to indicate hammer- and incus-carries, were found by Goercke in cases with intact ossicles, and, on the other hand, cases with extensive carious changes in the ossicles showed perforations in the lower half of the membrane or even (one case) an intact membrane. One rule was shown to be consistent: wherever carries of the osseous walls of the tympanum was present, on the tegmen or on the lateral attic wall, or on the promontory or on the posterior wall of the meatus, it was invariably accompanied by carries of the ossicles.

Demonstration of microscopical sections, macroscopic specimens, and stereoscopic microphotographs.

Discussion: KRETSCHMANN asks whether the rarer localizations of carries were found coincident with tubercular changes.

EHRENFRIED thinks that the spontaneous recovery of carries justifies the use of the conservative treatment.

BIEHLE welcomes the investigations made by Goercke as very important and interesting, and mentions that he had been ordered by the military authorities to formulate practical rules for the estimation of such affections.

GOERCKE: In the cases of rare localizations of carries, the suspicion of tuberculosis was aroused several times and in a very few cases verified. Although the possibility of a spontaneous recovery may justify a trial with conservative treatment, too much reliance should not be placed on it in practice.

25. DEUTSCHLÄNDER (Breslau): **Demonstration of four patients with rhinoscleroma.**

26. HINSBERG (Breslau): **On the mode of infection in meningitis caused by suppuration of the frontal sinus.**

If in meningitis due to an empyema of the frontal sinus no carious defects are found in the bony partition between sinus and dura, the usual inference is that the infection followed the paths of the vasa perforantia. This mode of infection is illustrated by the report of the following case in Hinsberg's practice: A patient with a suppuration of nearly all the accessory cavities, of which both antra have been opened previously, complained of a severe frontal headache on the right side; irrigation per vias naturales was negative. Although there was no fever, no nausea, no slow pulse, nor any other alarming symptom, an operation on the right

frontal sinus was performed to relieve the continuous and excruciating headache; the sinus was found to be divided by a septum and filled with pus. The carious orbital wall was removed; the cerebral wall appeared intact. During the night, patient became restless, and died in thirty-six hours.

Autopsy: Diffuse purulent meningitis, particularly of the right side. Dura over frontal sinus covered with a fibrinous layer, the bony partition thin, but free from macroscopic changes. Careful examination of the dura revealed a few very small nodules behind the sinus. Microscopic examination of bone showed the presence of numerous perforating vessels, and in several of them old, partly organized thrombi, in which no cocci could be found. The foci in the dura consisted of encapsuled conglomerations of round-cells with abundant cocci. The dura was considerably thickened over these places.

Discussion: HABERMANN mentions a case where, as shown at the post-mortem, an embolic brain-abscess of the right side had originated from perityphlitis; the abscess escaped into the right frontal sinus and thence into the left one, thus setting up an empyema of the left frontal sinus.

27. MANN (Dresden): **Mucocele of the right ethmoid cells.**

A man thirty-nine years of age had an injury to his head when young, and acquired syphilis twenty years ago. About two years ago he noticed a protrusion of his right eyeball and a perceptible diminution of his vision on that side. At first the fundus of the eye was found normal, but soon an optic neuritis set in and the vision fell to $\frac{1}{4}$. Mann, in April, 1901, found the right eyeball very much protruding forward and outward, and a tumor the size of a cherry and of a tense elastic consistence in the inner canthus of the eye. Rhinoscopical examination and pushing aside the middle turbinal with Killian's speculum showed the floor of the ethmoid very much crowded downward and inward. The bone, which was covered with anæmic mucous membrane, was perforated with a probe and the opening enlarged with a Hartmann's forceps; a thick, chocolate-colored fluid was evacuated, which contained no bacteria, but abundant cholesterine crystals. There was no further discharge from the cyst. During the operation the bulb sank deep into the orbit, but was pushed back into its old abnormal position during the following days from blowing of the nose. The optic neuritis has disappeared and the eyesight has returned to the normal standard. The affection is rare, eight

cases in all having been reported. Mann emphasizes the necessity of a careful nasal examination in cases of orbital tumors.

28. WERTHEIM (Breslau) : **Demonstration of a patient with bilateral empyema of the frontal sinus.**

Twenty-five-year-old man has had suppuration of accessory cavities since 1898. Left antrum and frontal sinus opened elsewhere Jan., 1898; five months later relapse and reopening of both cavities. The right frontal sinus had also been opened, but closed primarily, as no pus had been found. When patient came under Wertheim's care he complained of a severe headache on the right side, which disappeared after removal of an anterior hypertrophy of the right middle turbinal; there was no pus in the right nasal passages. December, 1900: Left frontal sinus opened, ethmoid cells found intact. March, 1901: Left frontal sinus nearly dry. After influenza in March, renewed acute inflammation of the right frontal and maxillary sinuses. Antrum opened, mucous membrane found diseased. At the end of April: Right ethmoid cells and right sphenoid sinus opened through the nose. The symptoms disappeared. At present the left frontal sinus is obliterated with the exception of its ostium; the right sinus shows a very scant mucous secretion. An attempt will be made to shut off the frontal sinuses from the nose to prevent their reinfection.

29. EHRENFRIED (Berlin) : **On the conservative and operative treatment of suppuration in the middle ear.**

Ehrenfried in his paper makes an ardent plea for the "conservative treatment" of purulent otitis media. His method consists principally in cleansing of the ear and instillation of a lysol solution, then using suction by means of a rubber bag, and repeating the whole procedure until no more pus appears.

Discussion: PREYSING: The paper is open to criticism on several points. It is to be regretted that the speaker has no knowledge of or fails to realize the brilliant results of the surgical treatment of middle-ear suppurations.

Availing themselves of the invitation of Councilman Dr. Steuer, the members of the society, on Saturday, before the morning session, visited the Department for Ear, Nose, and Throat Diseases in the All-Saints' Hospital.

This department, founded ten years ago by a legacy bequeathed by Dr. Jacoby, has been considerably enlarged since. The wards on the second floor contain four large rooms and one

single room, accommodating altogether fifty patients; on the second floor there are two rooms for nurses, the kitchen, and a bathroom with sweat-bed. On the ground floor are the polyclinic rooms, consisting of a waiting-room, large dispensing-room, and two dark rooms; the operating-room, an inhalatorium with four places, a special room for internal and acoustic examinations; the office of the chief-surgeon and the laboratory. The latter consists of two rooms, the microscopical room with three working places for histological and two for anatomical work, and a second room for the use of the microtome and for bacteriological investigations. The institution was greatly admired by the visitors, particularly the equipment of the clinical dispensing-room and of the clinical (5) working-places.

Brieger on this occasion demonstrated a number of interesting cases: a cerebellar abscess cured by operation (due to purulent otitis media following shotgun injury), several cases of sinus thrombosis, a case of leucæmic deafness, a case of traumatic atresia removed by operation, etc.

In connection with the sessions an exhibition of specimens, models, instruments, etc., was held in the adjoining rooms. Owing to the efforts of the executive committee and the large interest taken in the exhibition, the latter was so well arranged and extensive that it is impossible to describe or even to enumerate in this brief report the abundance of interesting exhibits. A complete catalogue will be added to the official report of the transactions. A few of the objects may here be mentioned to illustrate the scope and character of the exhibition:

Specimens and models of the human ear and its parts for teaching were numerous and manifold. Conspicuous were the beautiful preparations by Tramond of Paris, exhibited by the Anatomical Institute in Breslau. Models of the ear from papier-maché after Frohse were exhibited by the firm of Benninghoven and Sommer (Berlin). Other specimens for demonstrative purposes (normal and pathological): by Berliner (Berlin), plaster of Paris models and colored wax-casts of the ear; by Brühl (Berlin), sections of the skull, made transparent to demonstrate the topography of the nose and its accessory cavities; similar preparations by Katz (Berlin), with stereoscopic slides; by the Royal Polyclinic for Throat, Nose, and Ear patients in Breslau (Kümmel), numerous corrosion specimens after Siebenmann, Semper-

Riehm's dry-preparations; by the All-Saints' Hospital in Breslau (Brieger), dry specimens illustrating the development of the organ of hearing, specimens mounted in Kaiserling's fluid representing normal and pathological conditions of the middle ear, and preparations showing the possible injuries in ear operations, etc.

Pathological specimens (macro- and micro-scopical) were abundant: *e.g.*, by Biehl (Vienna), sinus thrombosis; by the Clinic in Rosstock (Körner), ossicles mounted between watch crystals; by the Clinic in Breslau, collections of foreign bodies, cholesteatomata, etc.; by the All-Saints' Hospital in Breslau, dehiscences in the different parts of the temporal bone; by Panse (Dresden), supuration of the labyrinth, etc. Drawings, pictures, radiograms, diapositives, etc., were exhibited: by Hartmann (Berlin), nasal accessory cavities; Habermann (Graz), otitis of the petrous bone; Scheibe (Munich), ankylosis of the stapes; All-Saints' Hospital (Breslau), caries of the petrous bone; numerous diapositives by the Optical Institute, Krüss (Hamburg).

Comparative anatomical specimens were presented by: Biehl (Vienna), petrous bone of sheep; Bönninghaus (Breslau), the ear of whales; Denker (Hagen), corrosion-preparations of the ear of several vertebrates. Bacteriological exhibits: by the All-Saints' Hospital in Breslau, cultures of all pathogenic germs met with in the ear. Apparatus, instruments, etc., were exhibited by physicians as well as by institutions, commercial firms, and engineers. Among others that were of interest were the following: by Keyser (Breslau), a physical apparatus for investigations on the vibration of sound in fluid media; by the All-Saints' Hospital (Breslau), an ear microscope, constructed by Zeiss in Jena; by the firm of Tiessen (Breslau), an electromotor with speed transformer for tympanum and larynx massage, and with air pump for inhaling purposes; also, equipments of bacteriological and histological working-places (principally models from the All-Saints' Hospital); by the firm of G. Haertel (Breslau), numerous instruments in use at the Royal Polyclinic and at the All-Saints' Hospital, as: a laryngeal forceps after Kümmel; an operating-table after Braatz; an apparatus with filter-syringe after Brieger for sterile irrigations of the ear. The Medical Warehouse (Berlin) exhibited beautifully made specimens and numerous new instruments; also a new examining- and operating-chair after Hartmann. The renowned firms, Detert (Berlin), Pfau (Berlin), and Katsch (Munich), were well represented.

REPORT OF THE SECTION ON OTOTOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.¹

STATED MEETING, MAY 8, 1901.

JAS. F. MCKERNON, M.D., in the Chair.

R. C. MYLES, M.D., Secretary.

Presentation of a case of **rodent ulcer of the ear.**

Dr. WOLFF FREUDENTHAL: This patient, whom I have the honor of presenting to the Section, was sent to me from the West Indies. He is forty-five years old and has been sick about six years. His disease commenced as a rodent ulcer, or epithelioma of the skin, below the ear. It progressed and affected the ear, and his attending physician, Dr. Lens, treated it with different astringents. The remedy that produced the best results was arsenic applied locally. The disease did not make any advance, so the doctor was satisfied with the use of astringents. Later on a new eruption appeared and the patient went to different physicians for treatment, all of whom advised a radical operation. Dr. Lens opposed it. In June of last year this operation was performed. As you may see, about two thirds of the ear and a good deal of the skin of the face were removed. Before the operation the hearing was good, but afterwards it diminished materially. The canal, which formerly was of normal size, is now very much smaller on account of the cicatrization. Right after the operation was done, the ear commenced to run, and it ran freely although the physician cauterized it frequently with the galvanocautery. When I first saw the patient, it ran very much and there was a bad odor with it. The mastoid was free. I could not make an inspection of the inner ear because I could not see anything on account of the narrowness of the canal. The probe en-

¹ E. Franklin Smith, M.D., Stenographic Reporter.

tered one and a half inches into the ear and I noticed bare bone towards the front. I am particularly interested in the treatment of this case. Among the different things that I have used experimentally for his relief so far is *electric light*. If the rays of electric light do what is claimed by so many, *i. e.*, if they are capable of killing bacilli, I thought this would be a good case for their application. We all know very well that the rays of electric light will destroy even tubercle bacilli, and I thought I ought to get some good effect from its application in this instance. I must say that the discharge has diminished very much so that now the patient does not require the use of cotton in his ear. The patient here is particularly interested in the question as to whether this might not develop into malignant disease. I would like the opinion of any of the gentlemen present. The discharge from the ear has not been examined as yet by me, but Dr. Lens did it. No tubercle bacilli were found. The glands were never swollen and there are no signs whatever of syphilis, nor of lepra.

Dr. ROBERT C. MYLES: I think it was a year or so ago that I presented to the Section a case of epithelioma similar to the one presented to-night. The specimens consisted of the cochlea, the promontory and part of the semicircular canals, which I removed. They were presented in a bottle. The epithelioma was removed and the disease never returned. The patient was in my office three days ago and appeared to be perfectly well, although he did not hear on that side. There was no discharge. No external incision had been made but the specimens were removed by cutting the canal open and dilating it; trephines and drills were used. A very bad prognosis was given, but the patient is now entirely well. In this case I advised opening up the canal and removing all the dead bone.

Presentation of a case of **mastoid fistula**.

Dr. THOMAS J. HARRIS: This case is a simple one yet I thought that possibly it might prove of interest to members of the Section. The patient is a woman of about twenty years, who was operated upon a year ago last March, an ordinary mastoid operation being done. She was in the hospital about eight weeks and was then discharged as cured. I think she kept on coming to the morning clinic to see the house surgeon for a period of two months after, when she dropped out of observation until the early part of last winter when she came to us complaining of much noise in the ear. An examination of the mastoid wound showed

a fistula in the extreme upper opening. This has persisted for two months. A probe introduced enters the attic. There is very little discharge, at times none. The drum membrane has entirely healed up.

I suppose the gentlemen of the Section have had many such cases, but I thought they might be interested and wish to look at it. The tube is quite patulous. The incus is in situ. I am in doubt as to whether I am justified in cutting down upon it without further symptoms being present.

Dr. HERMAN KNAPP, on being asked, said: I have had more experience in these cases than I liked. They may last for years, sometimes they will close, and later present themselves with an abscess formation, which, when opened, will heal up quickly and permanently. Probably the majority of them require only ordinary dressing and curettement to cicatrize smoothly and permanently. Other cases again will be covered with apparently healthy cicatricial tissue, but secretion will burrow underneath it and downward, forming a new crater, which will lead the probe to more deep-seated bare bone, necessitating scraping away the hard granulations between the two fistulas and resuming the treatment until, with a good deal of patience, a permanent, healthy cicatrization is brought about.

Presentation of a case of **brain abscess; operation, recovery.**

Dr. JAMES F. MCKERNON: This is a case of temporo-sphenoidal abscess which was operated upon February 8th. I saw the case on the 7th of February, and the symptoms present at that time were a very marked purulent discharge from the external auditory meatus, partial coma, temperature 97° F., pulse 54, respiration 16. The eyes were not examined, there being no facilities for an examination at that time. Upon removing the pus from the external auditory meatus, nothing could be seen in the deeper part at all except prolapsus of the superior and posterior wall, which came in contact with the lower wall. It was learned that the discharge had existed over a period of thirteen years.

The probable diagnosis was made of brain abscess. No effort at location was attempted. Operation was advised and performed the following day. Previous to the operation a probe was passed into the external auditory meatus, and encountered exposed bone over the inner tympanic wall; this was verified later, when it

could be seen where the destruction had taken place. Previous to the operation the discharge from the external auditory meatus was examined by the pathologist, Dr. Dixon, who reported that there were present a large number of streptococci, also some diplococci and staphylococci. The ordinary mastoid operation was performed. The mastoid was found to be as hard as ivory. Practically there was no mastoid antrum, its place being taken by hard bony tissue. Feeling sure that there was a collection of pus in the cerebrum, the incision was extended forward over the temple and the flap drawn upward. I found here softened bone directly over the roof of the tympanum extending upwards about $1\frac{1}{2}$ inches. A large collection of epidural pus was found beneath this bone. After its removal the dura bulged unusually into the wound. It was incised sufficiently to admit a grooved director, which passed inwards and upwards for about two inches. When it was withdrawn there followed no pus. The incision was then enlarged and the index finger introduced between two and three inches along the director when it came in contact with soft tissue and, upon its withdrawal, a discharge of pus followed. About four or five drachms of pus were evacuated, together with broken-down brain tissue. The cavity was irrigated with a hot saline solution and the patient taken back to bed, and no unpleasant symptoms followed for forty-eight hours. After irrigation, this cavity was packed, according to the method of Macewen, with gauze rolled in equal parts of iodoform and boric acid. The morning following the operation the pulse had increased from 54 to 82 or 86, and the respiration was normal. Previous to the operation the patient had complained somewhat of dimness of vision on that side, and light pains on both sides. The attending physician told me that aphasia was present. Forty-eight hours after the operation there was a slight rise in temperature (100.5°) with a correspondingly increased pulse rate. The dressings were removed, and a small amount of pus was found with quite a little serous discharge. The wound was again packed in the same manner as before with gauze rolled in a powder of equal parts of iodoform and boric acid, and this was left in for four days. The temperature dropped to 99° , and the pulse ranged from 75 to 86. This was six days after the operation. Owing to a suggestion made in this Section some weeks previous, I determined to try drainage by the use of tubes. The cavity was irrigated with the hot saline solution and a moderately

large tube used, down deep in the abscess cavity, then the usual dressings were applied. The patient was seen the following morning, apparently well; but, about 2 P.M., there was a slight rise in the temperature (100.5°); at 5 P.M., 101.2° . There was a corresponding increase in the pulse rate to 106, but the respirations were not noticed to be increased. There appeared marked aphasia for the first time in seven days, and the patient complained of an intense amount of pain. Thinking there was a collection of pus present, the dressings were removed and the cavity was found to be full of pus. The drainage tube had evidently not carried the discharges away. The wound was again irrigated with the hot saline solution, and the tube was discarded. The wound was then packed lightly with a wick previously rolled in equal parts of iodoform and boric acid. An uneventful recovery followed, and the patient was discharged twenty-eight days after the operation.

It is said that in all cases of brain abscess we should not irrigate the abscess cavity. I do not see why we should not, if there is anything to wash away. I know this procedure is contrary to the opinion of many surgeons who are experienced in this work. In a series of four consecutive cases seen, I have used hot saline solutions to irrigate with and all the patients made a good recovery. Three of these cases were temporo-sphenoidal, and one a cerebellar, abscess. Just enough pressure is applied to enable the fluid to pass in and out. Of course, during the last dressings no irrigation was used whatever.

The only symptom complained of now is an occasional lapse into the aphasic condition, which was quite marked for a time after the patient's dismissal from the hospital. At the present time there is a free communication with the middle ear. Above this communication a probe goes into soft tissue for probably about one inch. The abscess cavity has completely closed.

The epidural pus and also the pus from the brain cavity was examined by Dr. Dixon, who reported that the streptococci predominated. Attacks of pain had existed in this case over a period of three years.

Presentation of a case of **external otitis**.

Dr. WILLIAM H. BATES: The patient I have the pleasure to present to the Section had a complication of great interest following a mastoid operation, consisting in an inflammation of the cartilage of the external ear. The inflammation has increased since the operation upon both mastoids. Before the operation

there were no evidences of inflammation of the external ear. I would like to go briefly into her history with the hope of obtaining some indications for treatment from the members present.

This patient, about a year and a half ago, was attacked by influenza with acute purulent otitis in both ears. She was in bed about one month. She had an abscess not only in the ears, but also in the foot as well. I treated her for a few months and she made a good recovery. About nine months later she had a relapse with discharge from both ears. Her condition became worse with her general health much impaired. She lost weight steadily. Her bowels were constipated. She was unable to eat on account of increased nausea and she vomited almost everything she ate. Her pulse became slow, very weak and irregular, and her temperature subnormal. She had increasing attacks of pain in the ears, and after six months of treatment without benefit, I operated upon both ears. At the time of operation the pulse was about 30, and very weak and irregular. The temperature was below normal, and she had constant attacks of nausea and vomiting. I first operated upon the right ear. The pulse rose from 30 to 60. I then operated upon the left ear, and, while still under the influence of the ether, the pulse became stronger. I took away bone from the posterior and upper wall of the external auditory canal, opening up the parts freely, but I did not find any large amount of pus. Before the operation, the cartilage of the external ear had given her no trouble whatever. But, the next day, the external canal of both ears was completely stopped up, and she had a most agonizing pain which has continued pretty much ever since. The external canal of the right ear, at the end of about one month after the operation, became quite open, but that of the left ear has remained completely closed, so that I have been unable to introduce even the smallest probe into it.

I should like to have some of the members present look at her and make an examination of the ear and make some suggestions as to the treatment of the case. The slightest pressure cannot be borne by her. She has had attacks of swelling over the mastoid and its neighborhood, which have somewhat subsided, but there still remains some swelling over the bone. Since the operation, her general health has improved very much, and she has gained considerably in weight. But she still has a catarrhal inflammation of the stomach and bowels and some attacks of nausea. At the time of the operation I used some iodoform.

Dr. THOMAS J. HARRIS : What was the condition of the middle ear before the operation, and how much destruction of tissue was found in the mastoid cells ?

Dr. BATES : The mastoid cells were swollen and the bone was sclerosed, much more so on the right than on the left side ; the bone was like ivory. I had a bacteriological examination made, and the pathologist reported the presence of staphylococci. The middle ear was nearly normal.

It seems to me that this is a case of perichondritis of the auricles, and that it is complicated by a uric acid or a similar diathesis. I have seen several such cases caused primarily by injury which have failed to respond to treatment until the uric-acid condition of the patients had been corrected. I recall one case particularly, in which there was a gastro-intestinal catarrh, accompanied at intervals by a "gastric crisis." At the time of the "crisis" the auricles became red and swollen and took on an appearance similar to this case. In two other cases also of injury followed by perichondritis there were rheumatic affections of the joints, and the auricles failed to yield to local treatment until the joints became well under treatment.

Dr. THOMAS J. HARRIS : I agree with the statements made by Dr. Bates, but I think that, in addition to the uric-acid diathesis being an exciting cause, any operation upon the mastoid should also be considered an exciting factor. In the case just presented, I think the traumatism caused by the removal of the posterior wall, etc., is sufficient to act as an exciting cause.

In the cases that I have had I have noted a decided improvement by the use of varying sizes of drainage tubes. I remember one case of total occlusion of the canal, which was opened up by the use of the rubber drainage tube. If the Doctor has not tried this I would urge him to attempt this procedure.

Dr. EDWIN W. PYLE : So far as stenosis is concerned, I have had one or two cases in Dr. Whiting's clinic in which hot-water irrigations were used from a height, with a pressure from three to six feet, with excellent results. The good results came simply from the contracting influence of heat applied in this manner.

This mode of treatment is applicable to stenosed conditions arising from inflammatory action and not from cicatricial contraction. The latter will yield only to operative measures.

Dr. BATES (closing the discussion) : I am glad to hear what has been said about the uric-acid diathesis, because it applies so

well to the condition of this patient. She has uric-acid diathesis as badly as people get it. The urine at times has a specific gravity of 1.050, and only by the ingestion of large quantities of water and alkalies can this patient be made at all comfortable.

In regard to the operation itself being an exciting cause of this condition, I do not understand how that could be. I have done this operation more than twenty or thirty times, and I have never seen it occur before. This patient was operated upon six months ago, and the inflammation of the auricle is worse now than it ever has been. Not only did she have inflammation of the auricle, but it extended down the neck and in front of the ear.

Dr. Harris has referred to the use of tubes. We used tubes in this case, and they worked well in the right, but not in the left ear. I introduced quite a large-sized tube after the operation, but now I cannot get the smallest-sized probe into the left ear at all.

In regard to the use of hot water for syringing, the patient used large quantities of it (gallons during four months) to relieve the agonizing pain. I do not know when I have had a case where the treatment gave me so much concern as has this one.

REPORT ON THE PROGRESS IN OTOTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1900.

BY DR. A. HARTMANN.

Translated by Dr. ARNOLD KNAPP.

PHYSIOLOGY OF THE EAR.

284. **Adler.** On Flourens's experiment with the semicircular canals. *Monatschr. f. Psychiatrie*, Dec., 1900.

285. **Adler.** The vestibular reflex; the relations of the cerebellum to this and to the reflex tonus. *Ibid.*

286. **Dreyfuss.** Experimental study on the non-acoustic function of the ear labyrinth. *Pflüger's Archiv f. d. ges. Phys.*, vol. lxxxi., 1900.

287. **v. Stein.** A new independent apparatus to regulate automatically the ocular movements. *Centralbl. f. Physiolog.*, Aug. 4, 1900.

284. ADLER gives his views on the apparent movements which set in on irritation or cessation of action of each circular canal, and agrees with Ewald's theory. If the right external canal is divided, as the activity of the tonus labyrinth is constant, the right is arrested and the left receives increased stimulation, an apparent movement results, the head is turned to the left, which is followed by a reactive reflex head movement to the right. If the two posterior are divided, the two anterior preponderate, and the head turns back again; if the anterior are divided, the head falls forward.

DREYFUSS.

285. ADLER endeavors to explain the relations between the cerebellum and the vestibular apparatus and to the reflex tonus.

DREYFUSS.

286. This is a supplementary study to Ewald's well-known investigations. After describing the symptoms of the rotatory vertigo in the normal animal (guinea-pig), experiments on animals

with one-sided or two-sided loss of labyrinth are carefully detailed. Two phenomena are especially striking—the relaxation of the entire voluntary muscular apparatus and the absence of rotatory vertigo,—both of which can be explained by loss of tonus. The marked vertigo following one- or both-sided removal of the labyrinth can be easily explained by the theory of the tonus labyrinth. The terminations of the vestibular nerve in the acoustic hairs are the organs of static sense which inform us of rotatory movements and, in general, of our position in space. This results from the vestibular terminals transmitting a permanent tonus to all the striated body muscles. A number of clinical cases are added to show the absence of muscular tone and the unfavorable influence exerted by the loss of the tonus labyrinth in certain deaf-mutes on the muscles of speech and voice. Disturbances of co-ordination in the tabetic may be partly due to an atrophy of the vestibular nerve.

DREYFUSS.

287. V. STEIN has made a number of experiments on healthy persons and on those with ear disease, in rotation on the turning disc, which confirm in general well-known phenomena of rotatory vertigo. According to the reviewer, however, he has not succeeded in establishing a new independent apparatus which regulates automatically the ocular movements.

DREYFUSS.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

288. **Haug and Laubinger.** Report of the University Ear Clinic in Munich for 1899. *Arch. f. Ohrenhkt.*, vol. 1., p. 182.

289. **Reik, H. O.** Report on the examination of the ears of 400 school children. *Bulletin of the Johns Hopkins Hospital*, Dec., 1900.

288. 2917 patients were treated ; 12 radical and 21 Schwartze operations were performed.

BRÜHL.

289. A deficiency of hearing was detected in 45, or 10%. This was relieved in 13 by removing the accumulated cerumen. The remaining 32 showed the results of former ear disease or present abnormal conditions in the ear, nose, and throat, which would require treatment at the hands of an aurist. The upper tone-limit was examined in those able to give reliable answers and found to be somewhat higher than is usually given, and averaged 0.6 on the Galton whistle. The report closes with some interesting observations on the study of the auricle and its peculiarities ; the abnormalities are given in a table.

ARNOLD KNAPP.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

290. **Rhese.** Sympathetic ear disease. *Deutsche medic. Wochenschr.*, No. 46, 1900.

291. **Sendriak.** Syphilitic primary lesion in the mouth, pharynx, nose, and ear. *Monatschr. f. Ohrenhkl.*, No. 11, 1900.

292. **Cozzolino.** A case of pseudo-actinomycosis of the external ear, produced by a new thread bacterium. *Arch. f. Ohrenhkl.*, vol. 1., 1900.

293. **Burnett, Charles H.** Chronic ear-vertigo (Ménière's disease); its mechanism and surgical treatment. *Philadelphia Medical Journal*, Sept. 22, 1900.

290. RHESE reports three cases where removal of the hammer adherent to the labyrinth wall produced an improvement in the hearing of both ears. In two of these cases the chain of ossicles on the non-operated ear was not interrupted. Rhese believes that here the extraction of the hammer destroyed the synergic action of the tensor tympani in the other ear and caused the improved hearing and arrest of subjective noises. In the third case, however, the ossicular chain was interrupted and Rhese thinks that as both acoustic nerves anastomose with one another, inhibitory stimuli are transmitted through the tympanic plexus to the sound-perceiving part of the other ear. NOLTENIUS.

291. SENDRIAK collected 118 cases of primary lesion in the nose. The external site was usually on the alæ, internally on the septum, from an infected finger. In the naso-pharynx, the chancre occurred 88 times, nearly always the result of catheterization; 71 of these were described in French literature. This affection has only been reported 28 times on the external ear and twice in the canal. KILLIAN.

292. This patient, described in volume xlv. of the *Arch. f. Ohrenhkl.*, was taken ill, after two months of apparent health, with swelling of the neck, and died from meningitis. The autopsy showed extension of the purulent process along the lower plane of the temporal bone, thrombo-phlebitis of the venous carotid plexus and lateral sinus. Cultures of the blood showed the same resisting bacterium as the periauricular foci. BRÜHL.

293. Chronic ear vertigo, or Ménière's disease, is considered by BURNETT to be due to a mechanical cause, consisting chiefly in impaction of the stapes in the oval window. The object of the operation is to remove the retractive force producing the pressure, and thereby liberate the stapes, which will cure the disease. This is accomplished by a removal of the incus, which breaks the re-

tractive force of the tensor tympani and malleus exerted through it upon the stapes, and the latter bonelet is thereby relieved. While the production of ear vertigo in purulent cases is somewhat different from that seen in chronic catarrhal otitis, Burnett thinks that its mechanism is the same. In addition to removing the incus, it is necessary to excise the remnants of the diseased drum, the malleus, and whatever synechiæ are present before the stapes is freely liberated. In all, the operation has been performed twenty-seven (27) times for aural vertigo, mostly in chronic catarrhal otitides, and in no instance has it failed to give relief. No serious reaction has ever been encountered in either class after the operation.

J. B. CLEMENS.

C.—METHODS OF EXAMINATION AND TREATMENT.

294. **Lucae.** On bone-conduction. *Arch. f. Ohrenhkl.*, vol. 1., p. 187.
 295. **Gellé, Georges.** Bone-conduction in nervous patients. *Arch. Internat. de laryng., d'otol., etc.*, vol. xiii., No. 5.
 296. **Stenger.** Objective determination of one-sided deafness with tuning-forks. *Arch. f. Ohrenhkl.*, vol. 1., p. 197.
 297. **Jürgens.** On the value of percussion in the diagnosis of mastoid disease. *Monatschr. f. Ohrenhkl.*, No. 11, 1900.
 298. **v. Stein.** Phenosalyl in laryngeal tuberculosis and in diseases of the nose and ear. *Klin. therap. Wochenschr.*, No 43, 1900.
 299. **Lockard, Lorenzo B.**, Pasadena, Cal. The Eustachian bougie. *N. Y. Med. Jour.*, Dec. 29, 1900.

295. GELLÉ tested the hearing duration for tuning-fork a' in neurotic individuals with unaffected hearing, and compared it to the normal. In all, the duration was found shortened, and in the neurasthenics and hysterical the hearing duration became less on successive examination, while the opposite obtained in the melancholiacs and paranoiacs. Gellé believes the diminished durations to be due in all cases to inattention, associated with the psychic or nervous troubles.

SCHWENDT.

296. If two equally vibrating forks be held at different distances from both healthy ears, the nearest fork alone will be perceived. If an ear is supposed to be deaf, a fork c' is held 5 cm from this ear, another fork is approached to the healthy ear; if the former be deaf, the latter will hear the fork at a greater distance, or *vice versa*.

BRÜHL.

297. JÜRGENS, after accurate tests, concludes that percussion of the mastoid has no diagnostic value.

KILLIAN.

298. v. STEIN uses a 5 % phenosalyl solution in glycerine in

acute coryza, following cocainization, with good effect. It is also of value in chronic coryza, atrophic rhinitis, catarrhal pharyngitis, and tonsillitis. In some cases of chronic purulent otitis, the discharge was arrested. The solution employed is from 2-5 % in strength.

POLLAK.

299. LOCKARD concludes as follows : The bougie, except when used as an electrode, is applicable in two conditions only—stenosis and tinnitus. The therapeutic effects are uncertain, sometimes harmful, frequently beneficial. It effects its purpose in two ways : by pressure upon contracted tissue and by reflex influences upon the auditory centre. It should be given a thorough trial in all cases that have resisted other procedures. Its use must be stopped upon the first sign of increase in the local trouble. If care is taken, the dangers said to attend its application will be acceded to be of the greatest rarity. It has a definite field in aural surgery.

ARNOLD KNAPP.

d.—DEAF-MUTISM.

300. Costigun. Statistics of deaf-mutes in Rumania. *Arch. internat. de laryng., d'otol.*, vol. xiii., No. 5.

301. Ludwig. On the hearing of deaf-mutes. Thirty pupils examined with Bezold's tone series. Marburg, 1900.

302. Gibson, J. Lockhart. Useful hearing obtained in a deaf-mute aged nineteen years. *The Australasian Med. Gazette*, Oct. 20, 1900.

300. In Rumania there are 5292 deaf-mutes to six million inhabitants. It is most frequent in the mountainous parts where also struma occurs, more in the country than city population, and twice as many men as women are affected. Sixty per cent. of the cases followed acute exanthemata and meningitis and were chiefly associated with adenoid vegetations, alcoholism of the parents, pelagra, and malaria.

SCHWENDT.

302. The girl had been an inmate of the Brisbane Blind, Deaf, and Dumb Institute for six years. She could hear as a baby and had begun to talk a little before having measles at eighteen months. She had not talked since and was for all practical purposes deaf and dumb. Existing adenoids were removed and regular inflation was subsequently practised. These measures resulted in the patient hearing the ordinary voice at a few feet and in the commencement of speech.

CHEATLE.

EXTERNAL EAR.

303. **Trofimoff.** A case of microtia with atresia auris congenita. *Wratsch*, No. 37, 1900.

304. **Sagebiel.** On naphthalan in the eczematous diseases of the external ear. *Münch. med. Wochenschr.*, No. 48, 1900.

305. **Jürgens.** On the complications of acute purulent otitis and the connection between diseases of the various parts of the ear. *Monatschr. f. Ohrenhkl.*, No. 10, 1900.

306. **Habermann.** Pathology of chronic otitis media and of cholesteatoma of the external ear canal. *Arch. f. Ohrenheilk.*, vol. 1., p. 232.

307. **Zolewski.** A case of double rupture of the drum after a blow on the ear. *Wien. med. Blätter*, No. 47, 1900.

308. **Roberts, John B.** The operative treatment of "ugly ears." *Med. News*, Nov. 24, 1900.

309. **Hatch, W. K., and Row, R.** Fungus disease of the ear. *Lancet*, Dec. 1, 1900.

303. Fifty-six cases have been described, of which Bezold has examined sixteen carefully after the death of the patient. In the author's case a fold of skin 5 cm long and 1.5 cm broad occupied the place of the right auricle. A small piece of cartilage could be felt in the depth of the upper third, directly behind a small diverticulum 2 mm deep. There was no external auditory canal and the right half of the face was rudimentary. Rosenmüller's fossa and the Eustachian tube opening were smaller on the right than on the left side. The right ear was totally deaf; neither air- nor bone-conduction. The hearing of the left ear was diminished.

SACHER.

304. SAGEBIEL reports good results with naphthalan in the treatment of eczema.

BRÜHL.

305. An external otitis had led to a purulent otitis with mastoid involvement and sinus thrombosis; abscess in occipital lobe with rupture into the ventricle and a simultaneous basal meningitis. The course was rapid with slight external manifestations.

KILLIAN.

306. HABERMANN examined three cases of cholesteatoma of the external canal histologically. He regards a chronic inflammation of the epidermis of the ear canal and increased desquamation of the scleral layers as the cause of the cholesteatomatous formation. The former usually results from residual bacterial pus of a purulent otitis. At the same time a hyperostosis of the promontory and a partial bony closure of the round window were present.

BRÜHL.

307. Both ruptures occupied the lower part of the drum, one in the anterior, the other in the posterior quadrant, 3-4 mm apart; no trace remained after two weeks and the hearing was perfect.

POLLAK.

308. ROBERTS calls attention to the great improvement possible in many auricular deformities, by using strict modern antiseptic surgical methods. Roberts thinks it is the more worthy of attention as the operative treatment is free from risks and, usually, unaccompanied by confinement to bed or even absence from business pursuits. A lacerated auricle should be subjected to thorough sterilization and carefully sutured. After the removal of tumors or the occurrence of sloughing from burns, frost-bite, or injury, in order to restore symmetry of the two ears much artistic skill is required, as it may be necessary to operate on the uninjured ear to make it correspond with its fellow. Lost tissue may be supplied from the neck or cheek, or transplanted from the hand, abdominal wall, or thigh. Some deformities or distortions may be corrected by orthopædic means, and, to give rigidity to flaccid parts, imbedding of plates of platinum has been suggested. Fistulæ may be closed by dissecting out the tubular tract and closing the resulting wound.

J. B. CLEMENS.

HATCH (309) collected and carefully examined all cases treated at the Jamsetjee Jeejeebhoy Hospital in Bombay during the rainy month of October.

The diagnosis of fungus was verified in each case by microscopical examination.

The symptoms varied from slight to considerable deafness attended by pain which was occasionally severe.

The cases may be divided clinically into dry and moist forms. In the latter, the symptoms of eczema were present to a greater or less extent and there was always a watery or slightly purulent discharge. In the majority, the *aspergillus niger* was found; there being a quantity of moist-looking epithelium on which black particles were plainly visible, having the appearance of grains of gunpowder. If the particles were plentiful, there was more black than white visible. After syringing and clearing, the walls were red, often denuded of epithelium, and irregular with small furuncles and swellings, and the membrane either bright red in color or dull and sodden-looking. Often the *aspergillus flavus* could be seen growing on the surface of the small superficial pustules, and if in any quantity the small balls of sporangia were plainly visible.

The growth of *penicillium glaucum* gives a fluffy appearance to the surface. In the dry variety, the symptoms of pain, uneasiness, and deafness were also complained of, but there was no discharge. The canal was sometimes blocked with epithelial débris with yellow, black, or brownish-looking particles on the surface; in other cases the walls of the canal were coated with a crust, usually of a darkish color, on which the fungus could be seen growing, the appearance not being unlike that of rhinitis when dry crusts coat the surface of the mucous membrane. The membrane was then visible and the surface was generally partially coated with the same fungus. Sometimes white patches on the membrane were met with and were difficult of removal. After syringing, the walls of the canal were red but dry and the membrane was not so often inflamed as in the moist variety. Sometimes the amount of spores was largely in excess of the mycelium.

The treatment consisted in syringing very thoroughly and using iodoform and boracic acid in equal parts, cleanliness and dryness being most important factors. A summary of cases is given. Interesting descriptions of the varieties of fungi found are given by Row.

Hatch has administered subcutaneously some of the fungi to rabbits and monkeys; the lesions were, invariably, localized abscesses at the seat of inoculation, containing pultaceous, almost doughy, pus, which contained the mycelium as well as conidia.

The abscesses were, as a rule, well encapsuled, admitting of easy dissection. In one case where only mycelium was inoculated, the abscess contents were more fluid and mixed with blood.

The paper is an important contribution to the subject and should be noted.

ARTHUR CHEATLE.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

310. **Heine.** The particular danger of acute purulent otitis in advanced age. *Berl. klin. Wochenschr.*, No. 35, 1900.

311. **Weiss, Siegfried.** Prophylaxis of otitis in measles. *Wien med. Wochenschr.*, No. 52, 1900.

312. **Katz, L.** On excrescences of the drum membrane in acute purulent otitis; their treatment and histology. *Arch. f. Ohrenhkl.*, vol. 50, p. 211.

313. **Tomka,** Budapest. A case of acute purulent otitis in morbus maculosis Werlhofii. *Arch. f. Ohrenhkl.*, vol. 50, p. 207.

314. **Coulter, J. Homer.** Ear diseases in infancy and childhood. *Journ. Am. Med. Assoc.*, Dec. 15, 1900.

315. **Chambers, T. R.** Bacteriologic examination of purulent otitis media and suppurative mastoiditis. *Journ. Am. Med. Assoc.*, Dec. 29, 1900.

316. **Francis, Alexander.** Notes on a case of emphysematous otitis due to the bacillus *aërogenes capsulatus*. *Australasian Med. Gazette*, Oct. 20, 1900.

HEINE (310) reports four cases, and claims that acute purulent otitis in persons over forty years, even when properly treated, is an unusually dangerous illness owing to the insidious course and absence of symptoms of mastoid involvement demanding early intervention. The cause is explained by sclerosis of the bone and certain anatomical peculiarities (slight cellular development in the mastoid, spongiosa formation of the labyrinth). The mastoid should be opened in older people on the appearance of the swelling or infiltration of the mastoid integument, slightly prolonged tenderness, slight sinking of the wall of the canal, finally in violent headache even if the discharge from the middle-ear be free.

MÜLLER.

WEISS (311) recommends, as a prophylactic measure, correcting the occlusion of the nose on the ground that retention of mucus in nose and naso-pharynx causes the otitis. Treatment consists in the introduction of one per cent. yellow oxide of mercury ointment on a cotton applicator into the lower meatus, or the instillation of a one half per cent. silver nitrate solution. After one treatment the frequency of the otitis sank from 27.7 % to 18.7 %, and after four times daily treatment only 6.7 % of those affected with measles acquired otitis.

HARTMANN.

312. The author has overlooked Bezold's and Grünwald's articles on this subject, and regards the perforating polyp as an excrescence of the epidermis or cuticular layer of the drum, while in Bezold's opinion, with which the reviewer also joins, the protrusion is formed by hypertrophic mucous membrane of the inner surface of the drum. The latter, according to Grünwald, remains uncovered or becomes covered with the epithelium of the drum. KATZ's advice to remove this protrusion with a snare has been practised for many years. Between the superficial layers of the tumor distinct nests of leucocytes (pustules) can be formed.

DENKER.

313. A woman, aged twenty-one, became ill with morb. macul. Werlh.; hemorrhages occurred from the right external ear; in the left there were hemorrhages and a purulent otitis.

BRÜHL.

314. Ear diseases form a large or complicating factor in producing the high mortality during the first year of life. Acute and chronic middle-ear suppurations are the commonest ear conditions. Discharge from the baby's ear should not be neglected. A cause should be ascertained in each case. This is usually the exanthemata or adenoids. Early proper treatment can prevent complications. This consists of the application of heat and cold, early paracentesis, and suitable treatment of the naso-pharynx. Politzerization should be condemned.

ARNOLD KNAPP.

315. The discharge in 58 cases showed the presence of the streptococcus in 14, diplococcus pneumoniae (Fränckel) in 12, staphylococcus in 9, pyocyaneus in 6, colon bacillus alone in 2, associated with diplococcus pneumoniae in 3; in the rest these bacteria were found in combination.

The presence of the diplococcus pneumoniae assures a speedy cure and allows the mastoid wound to be sewn up completely. In streptococcus injection, cure takes place in fifty per cent.; in coli bacillus, the case, however, is practically incurable. Great weight is laid on the value of very hot-water syringing in the treatment of purulent otitis.

ARNOLD KNAPP.

316. The notes were read at a meeting of the Queensland branch of the British Medical Association on September 7, 1900. The patient one day complained of acute pain in the left ear. The pain, after continuing spasmodically for some hours, became agony. The membrane was found bulging and was incised, clear fluid escaping. The pain was at once relieved. The following day, pain was experienced in the right ear; a large bulla was seen on the posterior meatal wall, and was not implicating the membrane, which looked healthy. On puncturing this bulla, clear fluid fizzed out with such force as to cause a perceptible noise. The pain was relieved, but shortly returned, when the middle ear was found affected. The membrane was then punctured, with immediate relief. Cover-glass preparations examined by Pound showed the bacillus aërogenes capsulatus. As the bacillus is anaërobic, peroxide of hydrogen was used in treatment with a good result.

ARTHUR CHEATLE.

b.—CHRONIC PURULENT OTITIS.

317. Leutert. What is the present position as regards the treatment of chronic purulent otitis, and what is the latest opinion on cholesteatoma? *Münch. med. Wochenschr.*, Nos. 39-41, 1900.

318. **Eitelberg.** Conservative and operative treatment of chronic purulent otitis. *Wien. med. Presse*, Nos. 52 and 53, 1900.

319. **Sagebiel.** The treatment of chronic purulent otitis with amyloform. *Münch. med. Wochenschr.*, No. 49, 1900.

317. This communication brings nothing new, but it endeavors to make the important division of chronic purulent otitis into the dangerous and non-dangerous groups.

The marginal perforations up and back in Shrapnell's membrane are surely the most important, but the cause is not the complicating diseased bone of the antral wall or the carious ossicles, but the regularly associated cholesteatomatous process, as has been shown by Bezold and the reviewer. The antrum is affected in cases with central perforation. Caries and necrosis of the bony walls are usually absent when external signs are missing, but occur in the course of cholesteatoma. It is now generally accepted that the importance of caries of the ossicles has been exaggerated. Hence, the perforations occurring up and back, which signify caries of the incus, are not dangerous, according to the reviewer, who has never seen one of these cases end fatally.

According to LEUTERT, a marginal perforation up and back arises when persistent pus flows from the antrum, and the drum is destroyed up to the bony margin. There are, however, cases with central perforation where generally pus is also present in the antrum and where no marginal perforation takes place. The author advises immediate ossiculectomy in caries of the ossicles and radical operation in marginal perforations. The experience of many otologists has shown that caries of the ossicles and even cholesteatoma can frequently be cured by irrigation and insufflation with the tympanic canula. This method is not even mentioned by the author.

In those cases, even, where the otorrhœa cannot be completely arrested, the danger of a threatening complication can be practically excluded if the fœtor has ceased. Operation is indicated when this latter cannot be accomplished.

SCHEIBE.

318. In EITELBERG's case of chronic otorrhœa and polypi, recovery took place after separation of a small sequestrum without extensive operation. The author warns against too much operating.

POLLAK.

319. Amyloform has proved unsuitable.

SCHEIBE.

c.—CEREBRAL COMPLICATIONS.

320. **Ruprecht.** A case of complicated otitic brain abscess running the course of a cerebro-spinal meningitis with purulent spinal fluid. *Arch. f. Ohrenheilk.*, vol. 1., p. 221.

321. **Haskovec.** Several post-otitic affections of the brain. *Wiener med. Blätter*, Nos. 46, 47, 48, 1900.

322. **Heine.** Cases of otitic intracranial complications. *Arch. f. Ohrenheilk.*, vol. 1., p. 252.

323. **Randall, B. Alexander.** Review of surgery, with special reference to operation for phlebo-thrombosis of the lateral sinus. *University Med. Jour.*, Oct., 1900.

320. The error in diagnosis came from the lumbar puncture, which showed a cloudy fluid with leucocytes, but no micro-organisms, in a patient with meningeal symptoms following chronic purulent otitis (perforation of Shrapnell's membrane). The autopsy revealed an abscess of the temporal lobe; no meningitis. The large number of leucocytes observed in the lumbar fluid was regarded as the result of a toxic irritation of the abscess on the spinal fluid.

BRÜHL.

321. A patient, twenty-one years old, who had had otorrhœa since his third year, suffered from headache, vertigo, vomiting, diplopia, exaggerated patellar reflexes, and vasomotor irritability of the skin, slight left facial paresis, and indefinite disturbances of the soft palate and pharynx. Later there was a tremor in the left upper extremity, weakness of the left upper and lower extremities, increased strabismus, tenderness of the back of the neck, accelerated pulse and constipation. Diagnosis: Affection of the cerebellum or at the base. The author recommends trephining.

POLLAK.

322. HEINE has compiled sixty-one cases of uncomplicated diffuse purulent leptomeningitis, of which thirty-one followed acute, and thirty-two chronic purulent otitis. Lumbar puncture has of late been abandoned. In twenty-nine, meningitis followed disease of the bone, extending to the dura; in twenty-two, through the labyrinth, once by the auditory nerve. (Eleven unknown.)

BRÜHL.

323. In reviewing this subject, RANDALL thinks there are three points regarding which more must be made clear before the results shall be near their legitimate goal. These are: diagnosis, prognosis, and operative technic. The classical symptoms may be strangely absent in some cases, or there may be

complications present, masking their import. As to prognosis, the virulently infective cases and those less severe, but occurring in the weak and cachectic, are almost invariably fatal. Regarding technic, skilful rapidity is of the utmost importance. Jugular ligation, as proposed by Zaufal, is not always needful. As a later step it may be done in time to check the advancing process. When performed, the vessel should be slit open and evacuated, if not resected. Packing upon the sinus, rather than in it, has seemed best in occluding its lumen. Curetting is considered better than irrigation for a thorough removal of all possible pathological foci. Shock should be sedulously forestalled by avoiding blood loss, maintaining temperature, injecting hot saline solution, and the rapid and smooth use of the chisel, spoon, and rongeur, with little or no use of the mallet. The use of the aspirating needle is of doubtful meaning. Metastases already formed, even in the lungs, are not necessarily contra-indications for operation, since the secondary foci are generally less virulent and may heal. Brain abscess, especially in the cerebellum, should be constantly watched for, and may yield to prompt evacuation. Meningitis alone seems to preclude recovery; and, in some cases, its symptoms may promptly disappear after operation, showing that there has been a merely irritative affection.

J. B. CLEMENS.

d.—OTHER MIDDLE-EAR AFFECTIONS.

324. **Fischenich.** The treatment of catarrhal adhesive processes in the middle ear with intratubal pilocarpine injections. *Berl. klin. Wochenschr.*, No. 40, 1900.

324. **FISCHENICH** again recommends his intratubal pilocarpine injections in sclerosis. In thirty to sixty sittings, six to sixteen drops of a two per cent. pilocarpine solution are injected in each ear. His results are astonishing. In the majority of the cases the hearing was decidedly improved, and the unpleasant noises diminished. The result frequently was further improved by subsequent treatment. In only three cases a severe, but transient, reaction set in (hyperæmia of drum and severe pain).

MÜLLER.

NERVOUS APPARATUS.

325. **Alexander.** Comparative pathological anatomy of the ear. 1. The ear and brain of an incompletely albinotic cat. *Arch. f. Ohrenheilk.*, vol. 1., p. 159.

325. ALEXANDER found the following changes in the internal ear of a deaf cat: 1. Changes in form of the lower labyrinth. 2. Destruction and degeneration of the nerve terminals. 3. Complete absence of pigment. 4. Hypoplasia of the spiral ganglion. 5. Hypoplasia of the cochlear nerves. 6. Nuclei and roots of auditory nerve, temporal lobe, were normal, as well as the labyrinths of two of the animal's embryos. BRÜHL.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY.

326. Seifert, Würzburg. Nasal affections in their relation to general diseases. *Berl. klin. Wochenschr.*, No. 35, 1900.

327. Bruck, Berlin. On the reflex excitability of the nasal mucous membrane in relation to anaesthesia. *Berl. klin. Wochenschr.*, No. 20, 1900.

328. Muck, O. On acute iodine intoxication after use of iodide of potash, and its dependence on the quantity of rhodan in the saliva, nasal and conjunctival secretion. *Münch. med. Wochenschr.*, No. 50, 1900.

329. Keller. On the occurrence of rhodan in the nasal secretion. *Münch. med. Wochenschr.*, No. 46, 1900.

326. SEIFERT briefly reviews the relations of diseases of the nose to those of other organs. The article brings nothing new to the specialist. MÜLLER.

327. BRUCK has examined Rosenberg's method of cocainizing the nasal mucous membrane to avoid the danger of a reflex cardiac syncope or interference with respiration. He found that the parts could not be completely cocainized, and the result could only be obtained by plugging both nasal openings during the narcosis. MÜLLER.

328. MUCK found that after the use of iodide of potash with a large amount of rhodan, iodism always set in, while in patients where the rhodan was slight, iodide of potash was well borne. This agrees with the fact that rhodan can separate the iodine from iodide of potash. This interesting condition should be investigated with aid of a larger clinical material. SCHEIBE.

329. Rhodan is frequently found in the nose of children in the first months, though it may be absent in the saliva. SCHEIBE.

b.—METHODS OF EXAMINATION.

330. Löwe, Ludw., Berlin. Clearing away of the nasal cavities from the mouth and exposition of the corresponding parts of the base of the skull and brain. *Monatschr. f. Ohrenhkl.*, No. 10, 1900.

331. **French, Thomas E.** On the employment of the upright position in ether operations upon the nose, throat, and ear. *N. Y. Med. Journ.*, Oct. 13, 1900.

330. **LÖWE** recommends Partsch's resection of the entire palate and alveolar processes to expose the maxillary, ethmoid, and sphenoid cavities in inflammations of the sinuses, extensive polypoid formations, tumors, severe anomalies of the septum in the posterior segment, etc. After removal of turbinals and ethmoid, the anterior base of the skull is made accessible. The author has only practised this method on the cadaver. **KILLIAN.**

331. If the patient is profoundly anæsthetized, blood flows into the larynx, but the danger would not be great, if care was taken to prevent it. The blood can be drained from the mouth by tilting the head over, or it can be caught in sponges. The absence of the cough reflex is blamed for the subsequent occurrence of pneumonia, but in a thousand operations in the upright position, no accident of that kind has happened. **FRENCH** has constructed a chair, to which the patient is strapped; the side supports of the back of the chair slide into the rear legs, made of bicycle tubing; the top of the back is turned into a curved scroll to receive the head of the patient. The advantages of the upright position are: The reduction (*a*) of loss of blood, (*b*) of ear complications, and (*c*) of time for operating. **M. TOEPLITZ.**

C.—NEOPLASMS OF THE NOSE.

332. **Herzfeld.** A case of malignant epithelial tumor of the upper nasal cavities. *Berl. klin. Wochenschr.*, No. 36, 1900.

333. **Trofimoff.** A naso-pharyngeal polypus operated on by Ollier's method. *Wratsch*, No. 37, 1900.

334. **Curtis, H. Holbrook.** Epithelioma of the antrum of Highmore. *The Laryngoscope*, Oct., 1900.

335. **Grant, Dundas.** Case of probable primary specific ulceration of the tonsil. *Proc. Laryng. Soc.*, London, Nov. 2, 1900.

332. **HERZFELD** describes a case of epithelial carcinoma of the right nasal cavity, which had destroyed a large part of the bony base of the skull and had led to death from meningitis. An unusual feature was that the nasal discharge was without odor; the diagnosis of carcinoma could not be made from the rhinoscopic diagnosis. **MÜLLER.**

333. The tumor developed in a farmer sixteen years old in the course of two years. The left nasal cavity and half of the naso-

pharynx were filled with the tumor, interfering with respiration and deglutition. The tumor was of a pale red color, hard, and bled easily. After three fourths of the tumor had been removed by galvano-cautery, a severe hemorrhage put an end to the operation. The final extirpation took place a year later, by Ollier's method. The patient again lost a great deal of blood. The patient recovered and no recurrence has occurred. SACHER.

334. A lady of fifty years had complained of severe neuralgic pains on the left side of the face and painfulness upon pressure upon the antrum. There was no pus in the ostium maxillare. Trephining through the socket of the first left molar yielded bloody discharge mixed with brown caseous material. The nasal cavity was then still healthy. The condition from now on rapidly grew worse, involving the left nostril, jaw, and cheek, so as to cause, after fifteen days, a large opening to be made under ether, through the three posterior alveoli and the fossa canina, and an evacuation of the cavity. The floor of the orbit felt like tissue paper. The microscopic examination of the removed masses showed a malignant type of epithelial cancer. Mouth, eye, and entire nose then became involved. The death ensued at the end of the sixth week after operation. Only two cases of primary epithelioma of the antrum Highmori are recorded. M. TOEPLITZ.

335. A woman aged thirty-two years was first seen by DUNDAS GRANT on Oct. 11, 1900, complaining of sore throat of three months' duration. It was followed at an interval of about one month by the appearance of a few brownish spots on the skin; more recently there had been slight falling off of the hair. On examination there was an enlargement of the right tonsil and an irregular ulcer occupying the region of its upper third. The glands in the neck were enlarged. On the right anterior pillar was an ill-pronounced opalescent patch, and the same in a slighter degree on the left. There were no symptoms of genital inoculation. The husband had had syphilis twelve years ago.

Mercury by the mouth was first given, with slight results. Inunction had markedly benefited the condition.

ARTHUR CHEATLE.

d.—SEPTUM.

336. Hecht. Influenza perichondritis of the septum. *Monatsbl. f. Ohren- u. Halsk.*, No. 10, 1900.

337. Iljin. Acute abscesses of the septum. *Chirurgia*, vol. vii., No. 40, 43.

338. **Spencer, W. G.** Case of progressive sinking of the bridge of the nose following bilateral hæmatoma of the septum. *Proc. Laryng. Soc.*, London, Nov. 2, 1900.

339. **Snydacker, E. F.** Post-operative treatment after removing spurs of the nasal septum. *N. Y. Med. Journ.*, Dec. 29, 1900.

336. Report of a case of bilateral hæmatoma of the septum after influenza. KILLIAN.

337. The abscess is usually localized in the anterior segment of the septum. Necrosis of cartilage need not follow. Six cases are reported. SACHER.

338. A boy, two years previously, had had a fall on his nose ; there was then no displacement nor fracture of the nose, but on each side there was a well marked hæmatoma, just within the anterior nares. The hæmatoma was absorbed without suppuration and the nose appeared unaltered. A month ago the boy was again seen as a progressive sinking of the bridge was taking place. On examination the septum was found twisted, the mucoperiosteum thickened, and the passages much narrowed. There was no evidence of inherited syphilis, but it was impossible to exclude it with certainty. The mother had had miscarriages and dead children. ARTHUR CHEATLE.

339. **SNYDACKER** makes a strong plea for the careful post-operative treatment of the wound caused by the removal of the spur, since granulations spring up which either become cicatricial or rather occupy fully as much space as the original obstruction. By removing the crusts, cauterization of the granulations, and the use of vaseline, or, better, lanoline, this can be obviated.

M. TOEPLITZ.

e.—ACCESSORY CAVITIES.

340. **Brühl.** Anatomy of the nasal accessory cavities. *Berl. klin. Wochenschr.*, No. 41, 1900.

341. **Wertheim.** On affections of the accessory cavities of the nose. *Arch. f. Laryng.*, vol. xi., 2.

342. **Avellis.** The origin of the non-traumatic mucocoele of the frontal sinus. *Arch. f. Laryng.*, vol. xi.

343. **Halle.** The treatment of empyema of the antrum of Highmore. *Berl. klin. Wochenschr.*, No. 35, 1900.

344. **v. Stein.** A new needle for puncture of Highmore's antrum. *Monatschr. f. Ohrenhkl.*, No. 10, 1900.

345. **Struycken.** An aid in probing the frontal sinus. *Arch. f. Laryng.*, vol. xi.

346. **Glatzel.** On probing the frontal sinus. *Arch. f. Laryng.*, vol. xi., 1.

347. **Clark, J. Payson.** Bullous enlargement of the middle turbinated bone (concha bullosa). *N. Y. Med. Jour.*, Oct. 20, 1900.

348. **Duel, Arthur B.** A case of empyema of the antrum of Highmore, due to a foreign body; operation; recovery. *N. Y. Med. Jour.*, Dec. 1, 1900.

340. **BRÜHL** describes a method by which the cranial bones are made transparent and the cavities are filled with a metal alloy, thus demonstrating the topography and dimensions of the accessory sinuses. A number of skulls were examined, and practical deductions were drawn therefrom regarding accessory-sinus disease.
MÜLLER.

341. This extensive article is based on the results of 400 autopsies, with special regard to diseases of the nose and accessory cavities. It is only possible to give a brief outline of this very interesting paper. A nasal empyema was present in every fourth body. The maxillary and sphenoidal sinuses were most frequently combined; the combination of frontal and maxillary sinuses comes next. Every second individual succumbing to an infectious disease showed an empyema of one or more cavities. Vomited matter was found 12 times in the accessory cavities. Ozæna was present in 5; of which 3 had sinus affections. The author concludes that the latter was not the result of ozæna, but an associated condition. Acute suppurations usually recover of themselves with symptomatic treatment. The author, therefore, is inclined to regard the chronic suppuration as generally primarily chronic. An examination of 10,394 autopsy reports showed the relatively benign character of accessory-sinus disease. Six brain abscesses are described in detail.

The author is adverse to the extreme opening of the maxillary sinus, and practises irrigation through the alveolus. Brieger has abandoned the temporary resection of the anterior walls of the frontal sinus for Kuhnt's method. Conservative intranasal treatment is not sufficient. The author found serous exudates in 48 cases, chiefly in the sphenoid. The study of this valuable paper is recommended to every rhinologist.
ZARNIKO.

342. A girl, twelve years old, had a painless non-inflammatory swelling near the inner canthus of the eyelids for $1\frac{1}{2}$ -2 years. Incision evacuated tenacious, gray muco-purulent fluid. The lower turbinal was normal, the middle separated from the median wall, the floor of the ethmoid visible, smooth, and distended. The operculum of the middle turbinal was removed and the ethmoid opened. The incision near the eyelids was dilated, and

the cavity evacuated. The walls were smooth, gray ; extension 4-5 *cm* backward. Recovery. AVELLIS thinks that the frontal sinus was not affected, but that a cystic osseous cell in the anterior ethmoid labyrinth has displaced the frontal sinus, similar to a dentigerous cyst, and the maxillary antrum. Treatment of non-traumatic mucocoele of the frontal sinus should first be attempted by way of the nose. ZARNIKO.

343. HALLE prefers Krause's method to opening through the canine fossa or the alveolus : 1. The operation is not difficult and can be done without anæsthesia. 2. Communication with the mouth is avoided. 3. The patient is not annoyed by the constant taste of pus and iodoform. 4. Recovery takes place usually in a shorter time. MÜLLER.

344. The needle is very much curved, very long, and does not appear to us to be very practical. STEIN observed subsequent emphysema of the eyelids and cheeks in two cases. KILLIAN.

345. STRUYCKEN employed a probe with a steel extremity, which is magnetized. With a small compass brought near to the frontal sinus the location of the probe can be determined. ZARNIKO.

346. GLATZEL regards the above methods as faulty, and thinks that an exact orientation of the position of the probe is only possible with the actinoscopic examination. ZARNIKO.

347. CLARK reports two cases, occurring in women, æt. forty-five and twenty-two respectively, who complained of nasal obstruction, severe headaches, and, in the first case, diminution of the sense of smell. The removal of the middle turbinate, which measured 33:15:12 *mm* and 37:18:17 *mm* respectively, by means of the cold snare, cured the patients entirely. Clark found, besides two more of his own not fully described cases, 20 cases reported by others, viz., 24 in all, of which 20 were in women, 3 in men, and 1 without mention of sex ; 17 patients were over twenty years of age, the youngest sixteen, and 5 over thirty. A complete bibliography is appended. M. TOEPLITZ.

348. The patient, DUEL'S, a woman, had, in March, 1884, a right upper molar extracted, which was broken, the jaw being splintered. The wound closed, nasal discharge ensued. In August, 1885, the antrum was opened through the alveola, and irrigations kept up for five years. In February, 1890, the alveolar opening was allowed to close, but the nasal discharge continued.

In 1895, the removal of portions of the middle turbinal relieved the patient of acute symptoms. In the spring of 1898 the canine fossa was opened by Duel, to permit the entrance of a finger. A calculus of the size of a pea was washed out, the nucleus consisting of the fang of a molar tooth. The patient was cured in four weeks. Duel prefers the opening through the canine fossa for cases of antral empyema of long standing. M. TOEPLITZ.

f.—OTHER NASAL AFFECTIONS.

349. **Breitung.** A case of foreign body in the nose. *Munch. med. Wochenschr.*, No. 47, 1900.

350. **Eckert.** A case of nasal rhinorrhœa. *Eschmedelnik*, No. 50, 1900.

351. **Cohen-Kysper.** Pathology and treatment of asthma. *Deutsch. med. Wochenschr.*, No. 46, 1900.

352. **Baurowicz.** Congenital bilateral occlusion of the choanæ. *Arch. f. Laryng.*, vol. xi.

353. **Squires, G. W.** An unusual case of nose-bleed owing to a non-recognized foreign body. *N. Y. Med. Rec.*, Dec. 22, 1900.

354. **Foster, Hal.** The removal of thirty-five screw-worms from the nose. *N. Y. Med. Rec.*, Dec. 22, 1900.

355. **Holmes, Christian R.** Hypertrophy of the turbinated bodies. *N. Y. Med. Journ.*, Oct. 13, 1900.

349. Removal of a button which had been pushed deeper by previous attempts. SCHEIBE.

350. The patient, thirty-nine years old, was taken ill with fever, irritation in the nose, and a profuse watery discharge. On bending the head forward, the discharge appeared in drops and in a thin stream; measuring 120 ccm in twenty-four hours. Beyond a diffuse bronchitis the patient appeared to be perfectly well. The fluid was transparent, colorless, slightly alkaline, spec. grav. 1.0063, solids 0.96 %, salts 0.83 %, sodium chlorid 0.707 %, albumen 0.025 %; no mucin nor sugar; microscopically leucocytes and epithelium. No improvement by treatment. SACHER.

351. COHEN-KYSPER believes that an obstruction to nasal breathing is always a factor in the causation of asthma. Even a slight obstruction may cause in chronic cases a hyperæsthesia of the respiratory muscular sensibility, etc. The author removes every obstruction and in narrow noses resects the lower border of the inferior turbinal. NOLTENIUS.

352. Description of a case with literature. ZARNIKO.

353. The bleeding occurred in a man, æt. fifty, and could only be controlled by anterior and posterior plugging which had

to be kept up for ten days. It ceased entirely after two months. On scratching the nose about four months afterwards a point was felt through the skin on the outside of the right nostril, and a rusty needle, an inch long, broken off near the eye, was extracted.

M. TOEPLITZ.

354. A man, æt. seventy-two, whose nose, eyes, and face were badly swollen, suffered from excruciating frontal headache and bloody and offensive discharge from the nose. Worms were found in the nose, the great majority in the posterior nares, which had badly injured the middle turbinate and had made quite a large opening in the hard palate. They had been in the nose for two weeks and were removed with chloroform. M. TOEPLITZ.

355. Hypertrophy of the middle turbinates compared with that of the inferior is quite infrequent and mostly secondary to empyema of the accessory cavities. For removing polypoid hypertrophies, the snare is sufficient; for that of a portion or of all the bone, the scissors devised by HOLMES are preferable to the alligator forceps. Holmes has also removed 105 spurs, 80 in the male and 25 in the female. Among his 1500 operations, 43 were made upon patients under ten years of age; the oldest patient was seventy. A number of good illustrations are inserted and a bibliography is appended.

M. TOEPLITZ.

g.—NASO-PHARYNX.

356. **Tenier.** Dermoid polypi of the pharynx. *La presse médicale*, Dec. 19, 1900.

357. **Magenau.** The so-called vertebra prominens of the naso-pharynx. *Arch. f. Laryng.*, vol xi.

358. **Halsted, T. H.** Anæsthesia in children with adenoids, and in the adenoid operation with special reference to the dangers of chloroform in children of the lymphatic diathesis. *Phila. Med. Journ.*, Nov. 3, 1900.

356. A newly-born child, on coughing, protruded a pedunculated growth larger than a bean from the mouth; the tumor arose from the right side of the naso-pharynx. It was removed with the snare, and on examination proved to be composed of cutis tissues, probably a dermoid tumor from a branchial arch.

SCHWENDT.

357. This is a very thorough exposition on the subject of the so-called prominent vertebra in the naso-pharynx, without furnishing anything particularly new.

ZARNIKO.

358. HALSTED arrives, among other conclusions, to the following: Children with adenoids present the lymphatic diathesis;

they are in depressed general health and badly resist all heart depressants, such as chloroform, which is not comparatively safe, but should be feared during childhood. Adenoid operation in children under twelve years of age, without general anæsthesia, produces shock. Ether is incomparably safer than chloroform for these operations.

M. TOEPLITZ.

SOFT PALATE, PHARYNX, AND BUCCAL CAVITY.

359. **Besançon and Griffon.** The pneumococcus in anginas. *La presse médicale*, Oct. 24, 1900.

360. **Mayer.** Angina caused by Friedländer's bacillus. *Arch. f. Laryng.*, vol. xi.

361. **Derenberg.** Treatment of lateral pharyngitis with electrolysis. *Arch. f. Laryng.*, vol. xi.

362. **Töpfer.** Muscle and cartilage in tonsils. *Arch. f. Laryng.*, vol. xi.

363. **De Blois, Thomas Amory.** A case of superimposed uvula. *N. Y. Med. Journ.*, Dec. 22, 1900.

359. These authors have examined ten cases of non-diphtheritic angina and found the pneumococcus present in varying quantity. In some, the pneumococci preponderate, in others the streptococci; again in others various cocci were present (angines polymicrobiennes).

SCHWENDT.

360. Pseudo-diphtheritic, chronic recurring pharyngitis with Friedländer's bacillus present in the membranes.

ZARNIKO.

361. DERENBERG has treated seven cases of lateral pharyngitis with the electrolytic double needle. The reviewer cannot see any advantage in the method and prefers galvano-caustic punctures or chemical cauterization.

ZARNIKO.

362. TÖPFER found a muscular fibre in a tonsil removed for hyperkeratosis lacunaris. It was situated in a connective-tissue septum and was probably a proliferation of one of the muscles which have their insertion in the capsule of the tonsil. Islets of hyaline cartilage were also present. The author found cartilage in ten additional tonsils, and considers them an example of heterologous formation of cartilage out of fibrillary connective tissue.

ZARNIKO.

363. The halves of the uvula hung one in front of the other, not side by side. The left anterior pillar was connected with a perfectly formed uvula, but from the left posterior pillar, which on that side had an extra fold, hung a second uvula.

M. TOEPLITZ.

REPORT ON THE PROGRESS IN OTOTOLOGY DURING THE FIRST QUARTER OF 1901.

ANATOMY AND PHYSIOLOGY.

1. **Alexander.** Anatomy of the vestibular ganglion in mammals. *Sitzungsbericht der Kaiserl. Akad. der Wissenschaften zu Wien*, vol. viii., part iii., Nov., 1899.
2. **Wulf.** On the dimensions of the semicircular canals in vertebrates. *Arch. f. Anat. u. Physiol.*, 1901, 1.
3. **Peter.** The closure of the ear depression in the lizard. *Arch. f. Ohrenhkl.*, vol. li., p. 126.
4. **Panse.** The organ of hearing in the Japanese dancing mouse. *Arch. f. Anat. u. Phys.*, 1901, 1, 2.
5. **Denker.** On the comparative anatomy of the ear in mammals. *Ergebn. der Anat. u. Phys.*, 1901, 1, 2.
6. **Ostmann.** On the motility of the drum membrane and hammer. *Arch. f. Anat. u. Phys.*, 1901, 1, 2.
7. **Marage.** The rôle of the ossicles in hearing, with application to treatment of deafness and tinnitus. Published by the author, rue Duphot, Paris.
8. **Schaefer and Abraham.** On interference tones. *Arch. f. ges. Phys.*, vol. lxxxiii.
9. **Richter.** New laws on the stimulation of sensory nerves and two new electrodes for the ear and eye. *Monatschr. f. Ohrenhkl.*, No. 12, 1900.

1. ALEXANDER gives a very complete description of the acoustic ganglion in a large number of mammals and man.

DENKER.

2. WULF has measured the semicircular canals, ampullæ, their cubic contents, and the relations of the membranous to the bony parts in fish, amphibia, reptiles, birds, and mammals. The bony canal is always (1-20 times) larger than the membranous, which is always loosely attached on its outer side. BRÜHL.

4. PANSE does not consider the defective development of the cochlea to be the cause for the turning; the site is rather in the cerebellum. Corti's organ and the semicircular canals presented no anomaly. BRÜHL.

6. OSTMANN connected the head of the malleus with the kymographion during changes of pressure in the auditory canal and confirmed the following propositions of Helmholtz: 1. The handle of the malleus can be forced inward until the radial fibres of the drum are drawn tight; if the pressure continues, they would become curved and pull the manubrium outward. 2. The malleus makes a small turn with its head toward the incus.

BRÜHL.

7. The excursions of the stapes which Helmholtz found to be $\frac{1}{10}$ mm., are not over $\frac{1}{1000}$ mm., according to the author. The instrument used for these experiments was a siren which produced the most important tones of the vowels. With aid of a manometer, the smallest air pressure necessary to produce a given vowel could be determined. The new treatment consists in massage of the drum, with vibrations of the same amplitude as the tones composing the spoken vowels. SCHWENDT.

9. RICHTER uses an electrode like an aural catheter, the second electrode is conical and is placed in the external canal. KILLIAN.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

10. Kessel. Oration on the opening exercises of the new Ear Clinic in Jena on Dec. 14, 1900. *Arch. f. Ohrenhkl.*, vol. li., p. 177.

11. Alt. Report of cases. *Monatschr. f. Ohrenhkl.*, Nos. 1 and 2, 1901.

12. New York Eye and Ear Infirmary. *Eighteenth Annual Report*, for the year ending September, 30, 1900. Aural Surgeons: Bacon, Dench, Adams, Whiting, McKernon.

13. Manhattan Eye and Ear Hospital. *Thirty-first Annual Report*, for the year ending September 30, 1900. Aural Surgeons: Roosa, Pomeroy, Webster, Emerson, Lewis, Hepburn, Clemens, Phillips, Berens.

14. New York Ophthalmic and Aural Institute. *Thirty-first Annual Report*, for the year ending September 30, 1900. Aural Surgeons: Knapp, Toeplitz, Coburn, Jordan.

15. Minor, J. L., Memphis. The ear as a factor in causing systemic disturbance. *N. Y. Med. Jour.* Dec. 29, 1900.

16. Amberg, E., Detroit. Some remarks on the hygiene of the ear. *Philadelphia Med. Jour.* Dec. 15, 1900.

17. Lauterbach, L. J. The control and prevention of ear diseases among school children. *Journal of the Am. Med. Assoc.*, Dec. 22, 1900.

10. The number of out-door patients has increased from 517 in 1887, to 1372 in 1899, in-door patients from 62 to 332, operations from 58 to 398. The new clinic has 27 rooms and accommodations for 40 patients. DENKER.

11. An aneurism of a branch of the interior maxillary artery of the size of a cherry-pit caused a pulsatory blowing murmur, of musical character, which disappeared after removal of the aneurism. Two cases of labyrinth disease after mumps were cured without treatment. A case of diplacusis echotica is reported. Every tone below g^1 was heard double, probably due to a retarded hearing in one ear with retracted drum and tubal

stenosis. Very complicated disturbance of the musical hearing in a musician after a blow on the ear causing rupture of the drum. A case of cerebellar abscess and one of sclerosis improved by an acute otitis are reported.

KILLIAN.

12. Number of ear patients, 9843; operations, 1722; paracentesis of membrana tympani, 693; ossiculectomy, 17; mastoid operation, 263; Stacke operation, 4; cerebral abscess, 2; evacuation of cerebellar abscess, 3; epidural abscess, 26; thrombus of sigmoid sinus, 12; thrombus of internal jugular, 4; removal of granulations and polypi, 160; removal of adenoids, 211.

CLEMENS.

13. Number of ear patients, 4001; throat patients, 3167; operations, 941; operations on nose and throat, 1446; mastoid operation, 75; opening of lateral sinus, 6; cerebral abscess, 2; paracentesis of membrana tympani, 45; ossiculectomy, 6; excision of internal jugular, 2; removal of granulations and polypi, 10; removal of adenoids, 572.

CLEMENS.

14. Number of ear patients, and those of nose and throat in relation to the ear, 3053; operations, 505; mastoid operations, 43; paracentesis of the membrana tympani, 97; removal of aural polypi, 61; nasal, 19; removal of adenoids, 147; sinus thrombosis and ligation of jugular vein, 1; cerebral abscess, 1; epidural abscess, 1; ossiculectomy, 1; incision of furuncle, 35.

CLEMENS.

15. The author draws attention to the great frequency of ear disease in children, and as the general symptoms often outweigh the local ones the ear is often overlooked as the cause. The symptoms and treatment of otitis media purulenta are described. Illustrative of remote or systemic ear symptoms the following cases are cited:

CASE 1 was an acute suppurative otitis in a woman of twenty-three, whose cerebral symptoms, convulsive seizures, and delirium were relieved after paracentesis had been performed.

In CASE 2, acute intestinal derangements with cerebral symptoms in a child, one and a quarter years old, were relieved by treatment of the acute otitis.

CASE 3 was that of a child, eight years old, which suffered from septic fever and earache following measles, and was cured by treating the ear troubles.

CASE 4.—A child, fourteen months old, was ill with a continu-

ous high fever which could not be accounted for until the acute otitis media was discovered and treated with relief.

In CASE 5, a child of eight suffered from attacks of "bilious fever," which proved to be due to exacerbations, with retention of pus, of an old purulent otitis. ARNOLD KNAPP.

16. After speaking of the close connection between the nose, throat, and ear, and the importance of recognizing adenoids, the author advocates the proper consideration by people who are deaf of the aids to hearing, such as lip-reading, etc. More attention should be paid to the ears during the infectious diseases. Hygienic rules in general are of great importance in the prophylaxis of ear diseases,—breathing pure air, an equable temperature, and avoiding dust. Attention is drawn to the abuse of drugs, especially quinine, and the danger of loud noises, as on July 4th. Proper care of the mouth and teeth and respiratory exercises should not be neglected. ARNOLD KNAPP.

17. The importance of hearing for the mental development of the child is not sufficiently kept in mind. Deafness or partial impairment of hearing is not rare in school children; according to statistics, defect of one third or more in both ears occurs in 7 per cent., or 13-25 per cent. in one ear. The hearing of each pupil should be tested and questions asked to detect any disease of the ear or throat. This should be done by the teacher, or preferably by a school physician. Thus incipient troubles can be detected, when prompt treatment can cure. Enlargements in the throat and nose and catarrhal conditions should be observed. ARNOLD KNAPP.

b.—GENERAL PATHOLOGY.

18. Citelli. Bacteriological examinations of the healthy middle ear. *Archiv. ital. di otolog.*, vol. xi., No. 1.

18. The author describes his bacteriologic examinations of the middle ear in fifteen dogs and five cats. The healthy middle ear was usually found free from germs. The Eustachian tube is not in the estimation of the author, a certain safeguard against the invasion of micro-organisms from the naso-pharynx. RIMINI.

c.—METHODS OF TREATMENT.

19. Ostmann. Experimental investigations on the massage of the ear, Part iii. On the therapeutic value of vibratory massage in the deaf. *Arch. f. Ohrenheilk.*, vol. li., p. 81.

20. **Lucae.** On vibratory massage of the aural canal. *Arch. f. Ohrenheilk.*, vol. li., p. 1.

19. **OSTMANN**, to test the value of vibratory massage, examined the hearing with the voice and continuous tone series before and after treatment; also the effect on the subjective noises, in deaf persons with disturbance of sound conduction from (1) partial loss of drum, malleus, or incus, (2) sclerosis, (3) hypertrophic form of chronic aural catarrh, (4) cicatricial otitis media. In general, the value of vibratory massage is greatly restricted. In the cases of sclerosis, there was no improvement in hearing, and the tinnitus was temporarily relieved. In three cases of absence of drum and incus, the massage improved hearing for loud voice in one only. In one case, massage produced tinnitus of several hours' duration and headache.

A case of cicatricial otitis media was not improved; another was made worse.

The results are best in the hypertrophic forms of chronic middle-ear catarrh.

DENKER.

20. According to **LUCAE**, the chief value of the electro-pneumatic massage is that it enables us, in combination with Siegle's speculum, to test the motility of the drum and malleus. With the latest form of pressure probe, the sound-conveying apparatus in a normal ear can bear a weight of 300 g. without detriment. This instrument causes a much greater stretching of the ossicular ligaments than the massage. Lucae was able to produce a greater effect on the sound-transmitting apparatus by substituting for the ordinary massage apparatus one containing a non-compressible substance, like water, which in general was well borne by the patient.

Finally, the author describes his electro-pneumatic pressure probe, and believes to have had fairly good results in cases where the hydropneumatic massage has not availed.

DENKER.

d.—DEAF-MUTISM.

21. **Haike.** Treatment of deaf-mutes and reform in the medical service in the deaf-mute institutions of Prussia. *Deutsche med. Wochenschr.*, No. 6, 1901.

22. **Borischpolski.** The psychic life of deaf-mutes. *Wratsch*, 8, 1901.

23. **Lannois and Levy.** Deaf-mutism. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

21. It is well known that the medical supervision of deaf-mute

children is defective as regards knowledge of the ears, nose, and eyes. Recently it has been found that a greater part of deaf-mute children possess sufficient hearing power to receive instruction by ear, and that they should be separated from the totally deaf. It is equally important to remove the idiotic and feeble-minded from the deaf-mute school. During May, 1900, courses and lectures were given in Berlin to a number of physicians interested in the treatment of deaf-mutes.

NOLTENIUS.

23. After a brief description of the pathogenesis of mutism in intact hearing, the authors report nine cases observed in children under ten years. A cure is only probable when proper course of instruction is begun.

ZIMMERMANN.

EXTERNAL EAR.

24. **Chauveau.** Clinical cases. *Ann. des mal. de l'or., du lar.*, Feb., 1901.
25. **Swenzizki.** Chronic perichondritis of the auricle. *Chirurgia*, Nov., 1900.
26. **Iljin.** Bullous or hemorrhagic inflammation of the external ear, *Chirurgia*, Nov., 1900.
27. **Trautmann.** Removal of a large exostosis on the anterior wall of the auditory canal. *Arch. f. Ohrenhkl.*, vol. li., p. 193.
28. **Ljuri.** Traumatic injuries of the drum. *Wojenno-Medizinski Shurnal*, July, 1900.
29. **Mouselles.** A case of partial dry gangrene of the drum following traumatism. *Arch. ital. di otol.*, vol. xi., 2.
30. **Cheesman, Wm. S.** Cirroid aneurism of the ear. *Buffalo Med. Jour.*, Jan., 1901.
31. **McKinney, Richmond.** Rupture of the membrana tympani from indirect violence, with concussion of the labyrinth and complete deafness. *Jour. Amer. Med. Assoc.*, March 9, 1901.
32. **Richards, Geo. L.** An unusual case of traumatic rupture of the membrana tympani. *Laryngoscope*, Nov., 1900.
33. **Cheatle, G. Lenthal.** A new operation for prominent auricle. *The Medical Press*, March 13, 1901.

24. In the first case, a child of seven years, a tumor developed in the lobule, which was easily removed, and proved to be a fibroma with cartilage cells. In the second case, together with herpes of the lips and pharyngeal mucous membrane, two vesicles appeared on the drum. Healing took place in four days, with the exudation of some bloody serous fluid.

ZIMMERMANN.

25. After a fall on the ear, the auricle became very much swollen and an abscess developed. This was incised, the pain gradually let up, but the auricle remained enlarged and tender.

SACHER.

27. An exostosis $1\frac{1}{2}$ cm long and $\frac{3}{4}$ cm broad, composed of three nodules, was removed with the chisel after detachment of the auricle and division of the membranous canal. The incision in the membranous canal and the cutaneous wound were closed with sutures. Healing took place after four weeks, with normal hearing.

DENKER.

28. The number of ear patients in the Russian army is relatively large; 7 to 8 in 1000. From 1893 to 1897 in 100 diseases there were 21.3 ear affections; out of 1000 ill, 10.3 died of ear trouble, and 49.1 had to be excused from military service. In the etiology of ear troubles, traumatic injuries of the drum from blows on the ear occupy an important position.

SACHER.

29. The patient, thirty-six years old, had a perforation in the upper and back part of the drum, following a blow on the ear. Fifteen days later the ear was syringed, the perforation having in the meanwhile closed and a part of the drum appeared paler. This segment then turned a dirty gray and was surrounded by a red line, and later a kidney-shaped perforation was present, which subsequently diminished in size.

RIMINI.

30. The patient, female, had since childhood a cirroid aneurism of the left ear, which began as a simple telangiectasis. The entire auricle was enlarged and protuberant, the lobe hanging low on the neck; throbbing and twisting arterial varices were visible everywhere. Pressure on the left common carotid controlled the pulsation, which was subsequently ligated above the tendon of the omo-hyoid muscle. Pulsation of the varices ceased at once. The employment of electrolytic needling proved unsatisfactory. After the carotid ligation the ear measured four inches in length, its fellow two and one half inches. About one year later a slight return of the pulsation was observed, and a plastic operation was undertaken to further reduce the size of the lobule. This was successfully accomplished, and although the auricle is now five eighths of an inch longer than its fellow, all pulsation has ceased.

CLEMENS.

31. The patient, male, aged twenty-three, was hit over the right side of the head with a wagon-wheel spoke and was unconscious for fully a half hour afterwards. Hemorrhage from the ear and mouth followed at irregular intervals. Examination of the ear showed that the drum membrane, with the exception of the membrana flaccida, was intensely congested, and in the posterior quadrants was a large perforation, extending almost two thirds of

the drum's perpendicular diameter, which did not assume the usual oval shape seen in such cases, but was linear. Bone- and air-conduction were absent. The location of the blow and the continued expectoration of blood gave the impression of a fractured base.

CLEMENS.

32. The patient, male, aged forty-three, fireman, was struck, while at a fire, by a stream of water, receiving nearly its full force on the side of the head at short range. He was knocked down and stunned, and when he recovered, he had pain in the ear, and a serous discharge from it, for a day or two. Four days after the accident an examination showed a triangular rupture in the posterior inferior quadrant. The canal was cleaned, and a fine gauze wick put in it, and in eleven days healing was complete. Deafness and tinnitus resulted, but were only transient. There is doubt whether the rupture was due to compression of air in the canal, or to the impact of the water against the membrana tympani.

CLEMENS.

33. The case was shown at a meeting of the West London Medico-Chirurgical Society, held on March 1, 1901. The deformity was caused by excess in size and thinness of the antihelix. A crescentic portion of the antihelix and a small piece of the lower border of the helix were removed, the skin being then accurately sutured. The result was excellent.

ARTHUR CHEATLE.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

34. **Andrews, Albert H.** A new objective test for mastoiditis. *Journ. Amer. Med. Assoc.*, Jan. 26, 1901.

35. **Dench, Edward B.** The results of the surgical treatment of inflammation of the mastoid process. *Ibid.*, March 2, 1901.

36. **Knapp, Herman.** Suppurative tympano-mastoiditis in children. *Ibid.*, Feb. 23, 1901.

37. **Reik, H. O.** The value of formaldehyde in the treatment of suppurative otitis media. *Maryland Med. Journ.*, Jan., 1901.

38. **Williams, C. W.** The value of cataphoresis in caries of the temporal and other bones. *St. Paul Med. Journ.*, Jan., 1901.

39. **Calhoun, W. A.** Some observations in mastoid operations. *Journ. Amer. Med. Assoc.*, Feb. 23, 1901.

40. **Tuttle, T. D.** Mastoiditis. When does the disease begin and when shall we operate? *Denver Med. Times*, Jan., 1901.

41. **Spencer, W. G.** Arterial hemorrhage from the ear. *Brit. Med. Journ.*, April 27, 1901.

42. **Peter, Luther C.** Facial diplegia following middle-ear disease. *Pediatrics*, Nov. 15, 1900.

43. **McReynolds, Geo. S.** Report of twelve cases of mastoiditis and operation. *Maryland Med. Journ.*, Oct., 1900.

44. **Shackleton, W. L.** Two cases of mastoiditis. *Cleveland Med. Gazette*, Sept., 1900.

45. **Piffi.** On operations on the mastoid in complications of acute otitis media, with report of seventy-five operative cases. *Arch. f. Ohrenheilk.*, vol. li, p. 241.

46. **Rimini.** Acute mastoiditis after scarlatinous otitis. *Arch. ital. di otolog.*, vol. xi., 2.

47. **Tomka.** Hæmophilic hemorrhage from the ear. *Arch. f. Ohrenheilk.*, vol. li., p. 187.

48. **Katz.** Historical note to my paper on the excrescences of the drum in acute otitis media. *Ibid.*, vol. l. p. 211.

34. **ANDREWS** makes use of a tuning-fork and a stethoscope in determining the comparative density of the two mastoids, and offers it as a new method for diagnosing mastoiditis. The test is made by placing a small bell stethoscope over the mastoid tip, and a vibrating tuning-fork over the antrum. Should the cells be obliterated, or filled with pus or granulations, the sounds transmitted are perceived more distinctly than on the opposite or healthy side. In making the test care should be taken not to stretch the skin between the stethoscope and the tuning-fork, as the intensity of the vibration is increased thereby.

Forty cases without mastoid symptoms have been carefully examined with no perceptible difference in the resonance of the two sides, while in four cases of mastoiditis, the intensity was more marked on the diseased side. The fork used is c^2 512 v. s. and is so constructed that it is heard about thirty-five seconds in the normal ear. The stethoscope has a metal bell ($\frac{4}{8}$) five eighths of an inch in diameter.

CLEMENS.

35. **DENCH** believes that the otologist is as much justified in exploring the mastoid cells for diagnostic purposes, whenever there is the slightest evidence of inflammation, as the general surgeon is for similarly exploring the abdominal cavity. This view is based on the fact that in those cases where the pneumatic cells are well developed it is very difficult and often impossible to make a positive diagnosis until the disease has existed for several weeks and sometimes for several months. An early exploratory operation at the first signs of inflammatory involvement in such doubtful cases, would bring relief more promptly, prevent extensive complications, and avoid a tedious convalescence.

Closing the superficial wound with sutures to hasten the recovery is considered of doubtful utility. Recovery is quite as rapid when the entire wound is treated by the open method, pus retention being thereby completely avoided. CLEMENS.

36. From a tabulated study of thirty-nine mastoid operations in children under eight years of age, KNAPP has found that the greatest number of cases of mastoid disease occurred in the second year. An early diagnosis and treatment of suppurative otitis media in children are most important. The temporal bone in the young, with the open state of the squamo-mastoid and petro-squamous sutures, and the comparative softness of its texture, are carefully considered. CLEMENS.

37. In order to thoroughly clean the tympanum and render that cavity sterile in cases of acute and chronic suppurative otitis, REIK thinks that formaldehyde is the best and the most satisfactory antiseptic. The disadvantages attending the use of bichloride of mercury and boric acid in such cases are fully considered. The strength of the formaldehyde used is equivalent to a 1 to 300 solution of formaldehyde gas, and is prepared by adding one drachm of the commercial solution of formaldehyde (40 %) to one pint of boiled water. Its use seldom causes discomfort, but as some ears are more sensitive than others, should it cause any pain it is better to reduce its strength by using only half a drachm to the pint of water.

While it is not claimed that formaldehyde will cure all cases of otorrhœa, Reik believes that good results will be accomplished with more certainty and in considerably less time through its use, than by any other antiseptic employed at the present time.

CLEMENS.

38. In this case WILLIAMS found a sequestrum, or what appeared to be such, in the middle ear while performing a paracentesis, and treated it in the following manner: After incising the membrana tympani freely he filled the auditory canal with dilute hydrochloric acid, U. S. P., placing the anode pole well wrapped with cotton into the auditory canal very near to or touching the drum, and the negative pole over the mastoid of the opposite side. The street current of 110 volts was only regulated by a selector. He used no milliampere meter but graduated the force of the current by the sensations of the patient, and he states that he successfully passed through the head a voltage of 36 to 40 for a period of thirty minutes. The use of the acid produced a

dermatitis, which, far from being harmful was really beneficial by increasing the collateral circulation. The case was cured and has remained so for the past three years. The same treatment has been successfully employed in disease of the antrum of Highmore.

CLEMENS.

39. Mastoid disease is found to be relatively infrequent in the Middle Atlantic States, when it is compared with the total number of acute and chronic middle-ear suppurations, and when seen the disease is of a mild type and generally free from cerebral and other dangerous complications. The negro race appears to be singularly exempt from mastoid disease, as the writer in all his experience recalls but one case. The radical operation is seldom required to cure seemingly severe cases of mastoid disease since good recoveries are made under milder measures. CLEMENS.

40. The results of TUTTLE's experience in treating mastoiditis are given in the following résumé: "In all cases of otitis media purulenta there is more or less involvement of the mastoid antrum. In acute otitis media, with symptoms of mastoiditis, we are justified in using palliative measures for twenty-four hours. To delay operative measures for more than twenty-four hours, without marked improvement, is not justifiable. An incision in the posterior superior wall of the auditory canal is far superior to Wilde's incision as a depleting measure. All cases of chronic otitis media purulenta resulting in mastoiditis should be operated on at the first appearance of symptoms without resorting to palliative measures. We are justified in opening the antrum for drainage in cases of purulent otitis media of long standing without symptoms of mastoiditis."

CLEMENS.

41. A paper on this subject was read by SPENCER at a meeting of the Royal Medical and Chirurgical Society on Tuesday, April 23d. In twenty recorded cases, death resulted from ulceration into the internal carotid. Reference was made to three cases in which arrest of hemorrhage was obtained by ligature of the common carotid. His own case, which he related, was that of a boy, aged four years, who had recently had scarlet fever and who had had a severe hemorrhage from the ear, nose, and mouth. Arterial blood was dropping from the left ear and nose on admission to the hospital. The nose, ear, and naso-pharynx were plugged. A severe hemorrhage occurred, rendering the child almost pulseless at the wrist, and unconscious. The left common carotid was

ligatured low down in the neck, and saline fluid infused into the cellular tissue of each axilla and flank. The hemorrhage ceased, and three weeks later a small healing perforation was seen in the upper and anterior quadrant of the membrane. He thought that the bleeding occurred from the twig given off by the internal carotid to the tympanum.

ARTHUR CHEATLE.

42. The patient, a girl aged fourteen, while in the second week of scarlet fever, developed acute otitis media in both ears, which was followed by a free discharge. A few days afterwards the child had difficulty in swallowing fluids, but there was no nasal regurgitation. The characteristic appearances of facial paralysis developed on the left side, but it was not noticed whether the same condition existed on the right side from the beginning. The marked drawing of the face was not noticed until later, and it was then due to a partial recovery on the left side. The diplegia was more decided and apparent in the upper part of the face. The malleus and incus on the right side, and the malleus on the left, were destroyed. Deafness in both ears was due to involvement of conduction rather than to perception. The diagnosis offers no difficulties. The exact location, however, of the lesions is more difficult and must be determined, as in unilateral palsy, by the presence or absence of taste on the tongue, the amount of salivary secretion, the condition of hearing, etc.

CLEMENS.

43. A study of these reported cases shows that when the Wilde's incision was employed it neither stopped the otorrhœa nor prevented subsequent attacks of mastoiditis, that the breaking down of the posterior wall of the canal and cleaning out the middle-ear cavity is a procedure almost sure to materially affect the hearing, and that healing is slower than when the usual method of operation is employed.

CLEMENS.

44. CASE I.—The patient, male, aged twenty-one, had purulent discharge from the right ear for seven years, associated during the past two years with acute exacerbations. Temperature fluctuated between 100° and 105° , and finally there developed a distinct rigor. The drum was totally destroyed, and the upper wall of the canal was red, tender, and bulging. No swelling, pain, or tenderness on the mastoid. Although an operation was determined upon, before it could be executed a severe pain in the head occurred, with a rise of temperature to 103.6° . The patient rapidly became comatose. The mastoid was, nevertheless, opened, but no pus was found until the antrum was reached. A sinus in the

tegmen tympani was found, and upon enlarging it several drachms of pus escaped from the middle cerebral cavity. Death from leptomeningitis followed.

CASE 2.—The patient, male, aged twenty-one, was in the third week of typhoid fever when first seen. Pain and tenderness over the mastoid, and severe earache for past two days. Drum, which was red and bulging, ruptured during the examination, discharging bloody serum. No typhoid bacilli were found in cultures made from the discharge. Comfort followed, and profuse purulent discharge persisted for two weeks. A month later pain returned over the mastoid, and the upper wall of the canal was bulging to such an extent as to obscure nearly the entire drum. The mastoid operation only showed pus in the mastoid antrum.

The point emphasized in these cases is : that swelling is not a safe indication for operation, for it may be absent in chronic cases, and it may not occur in acute cases until perforation of the cranial cavity has taken place. CLEMENS.

45. A detailed report on seventy-five mastoid operations occurring in seven years in Zaufal's clinic. In all cases where the so-called teat-shaped perforation or perforating granulations formed in the drum, complications were present twice as pachymeningitis externa and twice as Bezold's mastoiditis; the corticalis was unchanged. This appearance may be regarded as an indication of unusual resistance or thickness of the mastoid cortex.

Bezold's mastoiditis occurred 9 times; of these, 3 succumbed to meningitis, 4 were healed by operation in twenty to forty-eight days, and 2 disappeared from view.

Changes in the eye grounds were observed 12 times; venous hyperæmia, dilatation and tortuosity of vessels, ill-defined papillary margins, and probable retrobulbar neuritis once. In these 12, intracranial changes were found in 9.

The practice of paracentesis, performed 12 times in 9 patients, was in no instance favorable, and the mastoid had to be opened. Complications of acute otitis are due to the virulence of the inflammatory agent or to especially unfavorable anatomical conditions. No advantage is obtained from Wilde's incision; in fact, recovery may be prolonged and the restoration of hearing is not so certain.

Slight rises of temperature are important in the estimation of indications for operation. A case of otitic pyæmia without sinus phlebitis was observed.

In recent years a part of the posterior wall was removed to

facilitate closure of the wound cavity. In 40 cases of mastoiditis, the cavity communicated 23 times with the posterior cranial fossa. In removing diseased bone, the middle cranial cavity was exposed 9 times, the posterior 10 times, and both fossæ 6 times. In 19 patients, the middle fossa was exposed exploratively 4 times, the posterior 7 times, both 8 times. In 3 of these 19 patients, exploratory opening led to the discovery of an intracranial complication.

Most of the complications occurred in the posterior fossa, *i. e.*, 40 times, while only in 4 in the middle. Sinus thrombosis was present in 5 cases, 2 benign, and 3 infectious.

After operation, the horizontal incision is closed with sutures, and the vertical down to the lowest part, to admit an iodoform wick. The wound is only left open in brain abscess, injury to the sinus, broken-down sinus thrombosis.

Healing took place in $87\frac{3}{4}$ per cent. In partial suture of the wound, the course of healing took $15\frac{1}{2}$ days. There were 6 deaths, 4 from meningitis, 1 septic from sinus thrombosis and meningitis, and 1 from uræmia. Three of the fatal cases are described in detail. In the first two cases of meningitis the infection was hematogenous, in the third, the meningitis followed purulent inflammation of the labyrinth extending through the aqueductus vestibuli.

DENKER.

46. Description of a case where the mastoid was infiltrated with pus and broken down. The sinus was accidentally injured in removing a bone spicule. Recovery took place. RIMINI.

47. Hemorrhage occurred from the left ear of a boy, two and a half years old, suffering from acute otitis media, eight days after paracentesis had been performed, and in spite of gauze packing and ergot internally continued for eight days. Another case is cited of bleeding from an ear polyp which was made to cease with great difficulty. Attention is drawn to hemorrhage from the carotid or internal jugular after paracentesis.

DENKER.

48. KATZ mentions in a supplement to his paper the publications of Bezold and Grünwald. His excrescences of the drum differ from the perforating aural polypi of these authors in the following manner: 1. No perforation with heavy inflammation and a resisting drum. 2. Growing in of the epidermis of the drum and formation of a canal. 3. Granulations from impeded discharge on the inner surface of the drum. 4. Hernial-like elevation of the drum, *i. e.*, of its epidermis.

DENKER.

b.—CHRONIC OTITIS MEDIA.

49. **Champaux.** Treatment of otorrhœa at the seashore. *Arch. internat. de laryng., d'otol.*, vol. xiv., p. 1.

50. **Ferreri.** The diagnosis of tuberculosis in chronic purulent otitis. *Arch. ital. di otologia*, vol. x., p. 2.

51. **Zeroni.** A case of carotid hemorrhage following caries of the temporal bone. *Arch. f. Ohrenheilk.*, vol. li., p. 97.

50. **FERRERI** emphasizes the importance of recognizing the specific nature of a chronic otorrhœa, as intratympanic surgery in presence of a tubercular suppuration is not without danger. If the clinical and bacteriologic examinations are negative, the author inserts dermatol-glycerin gauze in the canal. If the part which was in the middle ear turns black, tubercular otitis is presumably present. In cases of tubercular disease without caries, tuberculin injection should be tried.

RIMINI.

51. One week after a complete operation on a man with pulmonary phthisis, at the second dressing a profuse propulsive hemorrhage occurred from the depth of the wound, which was checked by packing. Two days later, another hemorrhage followed defecation, which was again checked by packing and compression of carotid. The patient went into collapse and died. At autopsy it was seen that the hemorrhage occurred through an opening of the tuberculously softened carotid wall with carious destruction of the carotid canal. The defect was at the usual site, namely, at the convex curve of the artery from the vertical to the central course. **ZERONI** recommends, in carotid bleeding following caries of the temporal bone, packing the external canal, ligature of the carotid, radical operation, and packing directly at the ulcerated part of the carotid.

DENKER.

c.—CEREBRAL COMPLICATIONS.

52. **Hammerschlag.** Otitic brain abscess. *Monatschr. f. Ohrenhkl.*, No. 1, 1901.

53. **Denker.** Otitic brain abscess, extradural and subperiosteal abscess in the temporal region healed by operation. *Deutsch. med. Wochenschr.*, No. 2, 1901.

54. **Stenger.** Otitic brain abscess. *Berl. klin. Wochenschr.*, No. 11, 1901.

55. **Taptas.** A case of perisinuous abscess consecutive to an acute purulent otitis after complete healing of the otitis. *Ann. des mal. de l'or., du lar.*, Feb., 1901.

56. **Panse.** Two cases of involvement of the sinus after mastoid operation. *Arch. f. Ohrenhkl.*, vol. li., 1.

57. **Jack, Frederick L.** Two cases of ligature of the internal jugular vein for infective thrombosis of the sigmoid sinus due to purulent otitis media; one recovery and one death. *Boston Med. and Surg. Jour.*, Feb. 28, 1901.

58. **Koller, Carl.** Case of thrombo-phlebitis of the left sigmoid sinus masking a latent brain abscess in the temporo-sphenoidal lobe, both arising from chronic otitis media. *New York Med. Jour.*, Jan. 19, 1901.

59. **Waterhouse, H. F.** A case of lateral sinus pyæmia and cerebellar abscess. Recovery. *Brit. Med. Jour.*, March 30, 1901.

52. **HAMMERSCHLAG** reports two cases of otitic brain abscess, of which one recovered. The data collected by Röpke concerning brain abscesses, up to 1898, are completed by the author to 1900. Thus 195 brain abscesses, diagnosed during life and operated on, are collected.

In one quarter the abscess followed an acute otitis, in three quarters a chronic otitis.

In the uncomplicated abscess, a rise of temperature occurred in more than one half. Rigors were seldom observed.

Tenderness in the temporal region was present 14 times; localized headache in 28.

Of 24 cases of unconsciousness and coma, 13 were cured.

96 abscesses of the left temporal lobe were associated with aphasia in 53.

Motor disturbances in the crossed extremities were frequently present (70 cases).

Of 106 operated on from the squama 32 (37.7 %), of 64 operated on from the mastoid 31 (48.4 %), and of 10 operated on from both places 8 (80 %) were healed.

KILLIAN.

53. A girl, aged seven, who had suffered for a long time from otorrhœa, was taken ill with symptoms (severe headache, uncertain gait, vomiting, one-sided mydriasis, and slight neuritis optica) suggestive of an otitic abscess in the temporal lobe. At the operation, no communication with the cranial cavity was found; the middle fossa was then laid bare in the squama over the tegmen. The dura was discolored and covered with granulations. An abscess was located in the temporal lobe with the aspirating needle, the opening enlarged, and 70-80 ccm fetid pus evacuated. Recovery uneventful. This case shows that the optic neuritis need not always be bilateral.

NOLTENIUS.

54. A girl, thirteen years old, with chronic otorrhœa, was operated on according to the radical method, on account of symptoms of retention. Signs of an intracranial complication (amnesic aphasia) intervened, and choked disc five days later.

The tegmen tympani was removed, and an abscess in the temporal lobe evacuated. A beginning cerebral hernia diminished after lumbar puncture. Recovery. BRÜHL.

55. TAPTAS reports the case of a girl, nineteen years old, where a paracentesis had been done for an otitis and the patient did not return for $2\frac{1}{2}$ months. The drum had healed, the hearing was normal, but there was severe pain behind the right ear, with loss of appetite and insomnia. This was followed by œdema over the mastoid and glandular swelling. At the operation, a carious area was found in the posterior wall of the mastoid, leading to a subdural abscess. The bone otherwise was sclerosed, but healthy. The dura and sinus were covered with dark granulations. Recovery. ZIMMERMANN.

56. In the first case, a healthy sinus had been exposed ; purulent phlebitis set in, caused, according to PANSE, from infection of suppurating mastoid wound. The patient succumbed to pyæmia and pulmonary metastases. The author warns against closing wounds where the sinus is exposed.

In another case of sinus disease, which recovered, the patient was in good condition, normal temperature, but the pulse was rapid, irregular, and hardly countable, while Grunert claims that strength and regularity of the pulse in sinus disease is a sure prognostic sign. DENKER.

57. Notwithstanding the favorable termination of cases where the removal of septic clots was successfully accomplished without ligation of the jugular vein, it is shown by the report of these cases that the weight of evidence is in favor of early ligation. If ligation of the internal jugular vein is performed before general septic invasion occurs, the chances of recovery are good ; if, however, a general septic condition has already developed, recovery is improbable. The conclusions of the writer are as follows : " In acute cases, before ligating the vein remove the purulent material in the sinus until a healthy clot is reached. After this operation, if rigors and elevation of temperature recur immediately, ligate the jugular vein and remove the entire thrombus above and below until a free flow of blood takes place. If at the original operation no healthy clot is found, ligate immediately. In chronic cases, no time should be lost in ligating the vein and completely removing the thrombus." CLEMENS.

58. The patient was a child, eight (8) years of age, who had chronic otitis media, with an occasional discharge from the left

ear. When first seen by the writer the child showed symptoms of mastoid disease, infective sinus phlebitis, and systemic infection, although there was no perforation or other pathological changes of the membrana tympani present. There was an optic neuritis of low degree. The case is reported principally to show that, when sinus-phlebitis is complicated with either an abscess of the temporo-sphenoidal lobe or meningitis, the symptoms of sinus-phlebitis not only completely mask those of the brain abscess, but partly those of meningitis as well.

The abscess in this case was of long standing, and communicated with the middle ear through a fistulous opening in the tegmen tympani. There was no indication shown at the autopsy that the abscess was caused by the sinus-phlebitis.

CLEMENS.

59. The patient was shown at a meeting of the Medical Society of London, held on March 25, 1901. As in many cases of cerebellar abscess, the patient ceased breathing under the anæsthetic, necessitating artificial respiration.

ARTHUR CHEATLE.

NERVOUS APPARATUS.

60. **Stein.** Certain disturbances of equilibrium in labyrinthine disease. *Medicinskoje Obosvenie*, Dec., 1900.

61. **Gradenigo.** Labyrinthitis in mumps. *Arch. ital. di otol.*, vol. xi., 1.

61. GRADENIGO describes two cases of labyrinth affection after parotitis, in a boy of six and a soldier of twenty-one. In the first, five days after the parotid swelling, total bilateral deafness set in, which remained stationary, notwithstanding intramuscular pilocarpine injections. In the second case, ten to twelve days after the parotitis, the left labyrinth became involved with deep subjective noises and deafness. The termination is not stated.

RIMINI.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY.

62. **Hofmann.** An unusual anomaly of the lateral nasal wall. *Monatschr. f. Ohrenhkl.*, No. 12, 1900.

63. **Chausserie-Laprée.** The early purulent rhinitis of scarlet fever. *Revue mens. des mal. de l'enfance*, vol. xiv., Feb., 1901.

64. **Cordes.** Hyperplasia and polypoid degeneration of the middle turbinal; nasal polypi and their relation to the bony parts of the ethmoid. *Arch. f. Laryng.*, xi., pp. 280-335.

65. **Sundholm.** On bone cysts in the middle turbinal. *Arch. f. Laryngol.*, xi.
66. **Renshaw, Knowles.** Nasal tuberculosis. *The Journal of Pathology and Bacteriology*, Feb., 1901.
67. **Morris, Malcolm, and Dore, S. Ernest.** Remarks on Finsen's light treatment of lupus and rodent ulcer. *Brit. Med. Jour.*, Feb. 9, 1901.
68. **Walsham, W. J.** A case of destruction of the nose, caused by a ferret. *Proc. Laryng. Soc.*, London, April 12, 1901.
69. **Parker, Charles A.** Notes on acquired syphilis of the nose and pharynx. *Lancet*, Jan. 26, 1901.
70. **De Blois, Thomas Amory.** Fractures of the nose. *N. Y. Med. Journ.*, Oct. 27, 1900.
71. **Cobb, Carolus M.** The purulent rhinitis of children as a source of infection in cervical adenitis. *Boston Med. & Surg. Journ.*, Jan. 10, 1901.
72. **Douglass, Beaman.** Emphysema of the eyelid from nasal causes. *N. Y. Med. Journ.*, March 25, 1901.
73. **Kyle, D. Braden.** A peculiar case of migratory foreign body with X-ray illustrations. *N. Y. Med. Journ.*, Jan. 19, 1901.
74. **Birkett, H. S.** Two cases of dermoid cyst of the nose. *N. Y. Med. Journ.*, Jan. 19, 1901.

62. Description of an accessory turbinal in the superior nasal meatus.

KILLIAN.

63. CHAUSSERIE-LAPRÉE finds that the purulent coryza of scarlet-fever patients is the most frequent cause of death in this disease. The symptoms and treatment are discussed; importance is attached to prophylactic nasal irrigations performed with a Nelaton's catheter. The chief complications of scarlatinous coryza are empyema of the accessory cavities, otitis, suppuration of the cervical glands, broncho-pneumonia, purulent conjunctivitis; the obliteration of the nasal cavities in sucklings may be directly injurious to life.

SCHWENDT.

64. The author describes twenty-seven cases in their clinical course and histological findings derived from the resected middle turbinal. 1. Hyperplastic middle turbinals with superficial inflammation of the mucous membrane (cases 1-4). 2. Hyperplastic middle turbinals, with inflammatory and polypoid degenerated mucous membrane (cases 5-11). 3. Polypi of the middle turbinal without manifest inflammatory bony changes (case 12). 4. Hyperplastic middle turbinal with extension of the inflammation to the periosteum and medulla (cases 14-15). 5. Polypoid formation of the middle turbinal (ethmoid labyrinth), with otitis but without purulent disease of an accessory sinus (cases 15-21). 6. The same changes, but with involvement of the accessory

sinuses (cases 22-25). 7. Transposition of an ethmoid cell in the middle turbinal (cystic formation, case 26). 8. Empyema of an ethmoid cell located in the middle turbinal, otitis and polypoid degeneration. The author draws the following conclusions:

Hyperplasia, polypoid degeneration, and some cases of polypoid formation of the nasal mucous membrane are produced by the same inflammatory process of the mucous membrane. The latter forms are but another manifestation of the same inflammatory process which in certain cases leads to serous exudation. Inflammation of the mucous membrane leads to hyperplasia of the bone from increased vascularization. The so-called mucous polypi are the result of an inflammatory serous exudate in the mucous membrane. In polypoid formation, the disease in the simple cases is located in the mucous membrane; in the multiple or relapsing cases, the bone is always involved. There may be a simple infiltration of the periosteum and medulla of the bone, but a chronic proliferating periostitis and osteoplastic otitis are the most frequent. The bone may be involved primarily (typhoid, scarlet fever, influenza, acute exanthem) or secondarily to the mucous membrane of the nose or the accessory cavities. The course and treatment of the disease depend upon the localization of the morbid process. If the mucous membrane only be affected, the removal of the polyp and diseased mucous membrane suffices. If the bone is also involved, the ethmoid labyrinth must be removed according to the extent of involvement. Disease of the bone is probable when after removal the polypi continue to recur. In certain cases the bone process may heal of itself, though the mucous polyp may persist. These are the cases of multiple polypi; simple removal proves effectual. Polypi are not pathognomonic for empyema of the accessory sinuses, as the latter develop more frequently from other causes. The empyemata are frequently the cause of polyp formation from inflammatory extension to the bone.

ZARNIKO.

65. Three cases of bone cysts of the middle turbinal with microscopic examination. These cysts are unusually well-developed ethmoid cells.

ZARNIKO.

66. RENSCHAW, after dealing with the history of the subject, describes the results of inoculating tuberculous sputum into the superior nasal fossa of guinea-pigs. Eight pigs were inoculated.

After describing the effects, he summarizes as follows: 1. Primary tuberculosis of the nasal mucous membrane does occur in

man, and not so infrequently as is generally supposed. 2. The simple introduction of the bacilli into the nostril of a susceptible animal without any abrasion may cause tuberculous infection. 3. Infection having occurred, the disease tends to run a slow course. 4. Probably the farther from the entrance of the nostril the seat of the lesion, the more rapid the course of the disease, and the earlier the invasion of other organs. 5. The system is, as a rule, invaded by means of lymphatics, though very occasionally by other routes.

ARTHUR CHEATLE.

67. The technic, etc., of the treatment are given and a good result in lupus vulgaris of the nose is recorded.

ARTHUR CHEATLE.

68. The patient, aged twenty-four years, was attacked by a ferret at the age of three months. The whole of the nose, part of the skin of the forehead, and a large part of the middle of the upper lip was destroyed. Eighteen plastic operations had been performed.

ARTHUR CHEATLE.

69. This paper is a comprehensive and useful one and is based on PARKER's observations at the Throat Hospital, Golden Square. The disease is dealt with in its three stages and stress is laid on such signs and symptoms as should lead to prompt recognition. He insists on mercurial inunction combined with iodides internally in rebellious cases.

ARTHUR CHEATLE.

70. The injury may involve the two small nasal bones alone, or more severely the nasal process of the superior maxillary or the zygomatic arch of the malar bone. It may occur during parturition, nursing or sleep of infants, later most frequently by falling, running into objects or blows, and during manhood mostly by sparring. The reduction is not difficult, if the injury is recent and the reduced parts are held in place by internal and external splints.

M. TOEPLITZ.

71. As a type of cases, in which purulent nasal discharge is the cause of cervical adenitis, COBB cites that of a child, without any history of previous trouble with the nose or throat, contracting diphtheria at the age of two years, which is followed by purulent discharge. Two years later, enlarged tonsils and adenoids are removed, and one year after the operation she still has a purulent discharge from the nose and a cervical adenitis following an acute coryza. Cobb claims that the source of infection, which causes cervical adenitis, is in close proximity to the glands involved, viz. the mouth, throat, nose, or ear; only in a small percentage of

cases systemic infection is at fault. Purulent diseases of the nasal cavities are the source of infection, acute infectious diseases being the exciting cause.

M. TOEPLITZ.

72. The accident occurs either after a trauma, also after operation, through a pre-existing opening between the orbit or ethmoid cells, or an by injury to the lachrymal duct through operation or disease, after the nose has been forcibly blown. In the four cases reported by DOUGLASS, it was observed in two after operations on the ethmoid cells, in the other two without it, after simple blowing. In the ethmoid cases, the lamina papyracea may be perforated, and it is, therefore, advisable to open the cells before or without removing the protecting middle turbinate. The filling of the upper lid with air in ethmoid cases is due to the fact that the wall of the orbit is perforated near the middle and that the air enters the space between the orbital periosteum and the first fascia of the eyeball, the layer above the extrinsic muscles.

M. TOEPLITZ.

73. The first attack, during the latter part of January, 1887, lasted nine weeks. There was a sensation of something crawling underneath the scalp, that seemed to extend from the back of the neck forward over the top of the head, followed by considerable swelling and severe pain. Repeated milder attacks occurred until 1890. The swelling and sensations travelled forward with each attack, and tenderness over the mastoid became quite pronounced. In December, 1898, the peculiar sensation had reached the forehead, with considerable external swelling and profuse discharge of pus from the nostrils. Whereupon, in freeing the nostril by rather forcible blowing, about half an oxidized needle was found in the handkerchief. KYLE, on August 23, 1899, found a swelling on the right side of the face, extending to the antrum Highmori, the orbit, and the base of the nose. An X-ray picture revealed the presence of a foreign body, but nothing determined its exact location. A few days after an exploratory opening, about a quarter of an inch back of it, a needle projected from a ruptured swelling, and was withdrawn. How the needle entered, nobody knows.

M. TOEPLITZ.

74. CASE 1.—A young man, æt. sixteen, with a "discharging sore" near the tip of the nose in the middle line, which repeatedly burst, closed, and reappeared. A small circular opening, 2 mm. wide in the middle line and about 5 mm. from the tip, showed by skiagram a fine dark line, leading from the centre of the opening

directly upward and backward into the septum. This sinus was lined by dense fibrous membrane and covered with sebaceous material. At the distal end several fine hairs were found. Good result after dissection of the cicatrix. CASE 2.—In a boy, æt. eight, a tumor, existing since birth, had gradually increased and is now oval, occupying the greater portion of the bridge of the nose, extending from one quarter of an inch above a line drawn horizontally from the eyebrow on the one side to that of the other and continuing downward for an inch, reaching about the centre of the nose. At the upper portion it is broader and gradually narrows below, assuming thus somewhat the shape of a pear. At the lower point a few fine hairs were noticed. In length it measured $1\frac{1}{4}$ inches, in breadth, at the widest part one half inch. A third case was observed in a girl, nine months old, presenting at birth a tumor, of the size of a small pea, in the middle line and near the tip of the nose. Six additional cases are found in literature, and seven photographs and a skiagram illustrate the paper.

M. TOEPLITZ.

b.—METHODS OF TREATMENT.

75. **Struyken.** Nasal tamponades. *Arch. internat. de laryng., d'otol., etc.*, vol. xiv., No. 1.

76. **Lichtwitz.** Apparatus for the hot-air treatment of the nasal cavities. *Arch. internat. de laryng., d'otol., etc.*, vol. xiv., No. 1.

77. **Hamon du Fougeray.** Chromic acid in 50 per cent. solution in the treatment of malignant tumors of the pharyngeal, nasal, and laryngeal mucous membrane. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

75. The author recommends for packing the nose a sterilized finger cover which is filled with gauze soaked in vaselin when in position.

SCHWENDT.

76. The receptacle for compressed air is expensive and the transportation by rail is slow. LICHTWITZ recommends an electro-motor of 120 volts for charging.

SCHWENDT.

77. FOUGERAY obtained good results from chromic acid in three cases of malignant disease. The first, a woman of thirty-eight, with an ulcerative infiltration of the soft palate, which remained healed after scraping and chromic-acid applications for at least two years. A similar case, in a woman of fifty, was in process of recovery when the patient died of bronchitis. In the third case, the dyspnoea caused by a larynx tumor was temporarily relieved.

ZIMMERMANN.

c.—SEPTUM.

78. **Boenninghaus.** Resection of the cartilaginous and bony septum in marked deflection. *Arch. f. Laryng.*, xi.

79. **Kreilsheimer.** The after-treatment of operations for nasal spurs. *Arch. f. Laryng.*, xi.

78. In most cases, according to the author, Krieg's resection cannot be dispensed with. The mucous membrane on the convex side need not be preserved. The portion of the septum to be resected should rather be too large than too small. The length of operation ($\frac{1}{2}$ to 1 hour) is justified by the result obtained.

ZARNIKO.

79. **KREILSHEIMER**, to avoid the unpleasant packing, recommends that the wound edges be touched with glowing galvano-cautery after operation and xeroform applied. (The reviewer begs to point out that after a properly performed operation packing may be dispensed with except in very few cases where the blood-vessels spurt.)

ZARNIKO.

d.—NEW GROWTHS.

80. **Schwendt.** Malignant tumors of the accessory nasal sinuses. *Arch. f. Laryng.*, xi., 3.

81. **Ferreri.** Tumor of the sphenoidal sinus. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

82. **Lack, H. Lambert, and Baber, Cresswell.** The treatment of nasal polypus. *Proc. Laryng. Soc.*, London, Dec. 7, 1900.

83. **Wright, Jonathan.** The non-myxomatous character of nasal polypi. *N. Y. Med. Rec.*, Jan. 26, 1901.

84. **Ball, J. B.** Endothelioma of the nose. *Med. Press*, March 13, 1901.

85. **Wagner, Henry Lewis.** Angeioma cysticum of the nose. *N. Y. Med. Journ.*, March 16, 1901.

80. A report of ten cases belonging to Prof. Kümmel in Breslau. 1. Carcinoma of the maxillary antrum; empyema. Perforation in cheek. Tumor at first not recognized. Resection of sup. maxilla. Healed, early recurrence. 2. Epithelioma of the maxillary antrum. Empyema of the maxillary and frontal sinus. Partial resection of sup. maxilla. Early recurrence. 3. Round-celled sarcoma originating in ethmoid. Empyema of the ethmoid cells; perforation into orbit. Mental disturbances. Incomplete operation. Death. Tumor had invaded both frontal lobes. 4. Spindle-celled sarcoma arising from the anterior ethmoid cells. Intranasal removal. No recurrence after six months. 5. Hard papilloma arising from the anterior ethmoid cells.

Intranasal removal. Empyema of the frontal sinus. 6. Fibrosarcoma of the anterior ethmoid region. Empyema of the right maxillary antrum. After repeated intranasal removal of the growth, radical operation attempted. Death from meningitis. 7. Carcinoma of the posterior ethmoid cells. Early ocular symptoms. Exophthalmos; diplopia. Epistaxis. Intranasal removal. Later psychic disturbance. 8. Small round-celled sarcoma, originating in ethmoid. Epistaxis. Incomplete intranasal removal. Recurrence. Exophthalmos. Blindness. Incomplete extirpation with resection of the external nose. Dura exposed. Temporarily healed. 9. Soft papilloma of the roof of the nasal cavities, extending to the perpendicular plate. Intranasal removal. Recurrence after months. 10. Carcinoma of the sphenoid cavity. First symptom, otalgia. Slow growth in 9 months. The paper concludes with description of the symptoms, especially those dependent on the localization of the tumor. ZARNIKO.

81. A very complete history of a woman of sixty who had a hard tumor in the naso-pharynx, arising from the roof, and of slow growth. Attempts at removal were unsuccessful. The patient died of apoplexy and at autopsy it was seen that the growth originated in the sphenoid sinus and had extended into the cranial cavity. ZIMMERMANN.

82. An interesting and instructive discussion, of which it is impossible to give an abstract. Dr. LACK illustrated his paper by a series of diseased middle turbinate bodies, showing the transition stage between simple œdema and true polypus, and by a series of microscopic slides of sections of the bone underlying polypi showing various degrees of periostitis and osteitis.

ARTHUR CHEATLE.

83. WRIGHT proves that the histological character of mucous polypi is not myxomatous, but œdematous. This mistake has caused a halt in the understanding of the pathological processes in the nose. M. TOEPLITZ.

84. The case was reported by BALL at a meeting of the West London Medico-Chirurgical Society, held on March 1, 1901. A young woman had a small growth removed from the inside of the ala nasi. Shattock reported that it was a connective-tissue or endothelial growth arising from lymphatic endothelium.

ARTHUR CHEATLE.

85. The tumors were found in the noses of a boy nine years

old and of a woman twenty-eight years old, respectively, obstructing the entire posterior portion of one side of the nose, and protruding somewhat into the naso-pharyngeal cavity. They were quite elastic, movable, and attached to a small base below the foramen sphenopalatinum; contained a brownish fluid with large quantities of serum-albumin and, microscopically, in the cyst wall, principally venous vessels and cavernous sinuses, as illustrated by the accompanying cut.

M. TOEPLITZ.

c.—ACCESSORY CAVITIES.

86. **Avellis.** The ulcer of the mucous membrane in acute empyema of the accessory cavities. *Arch. f. Laryng.*, xi.

87. **Onodi.** Relation of the maxillary antrum to the sphenoid cavity and to the anterior ethmoid cells. *Ibid.*, xi.

88. **Furst.** Opening of the two sphenoidal cavities across a healthy maxillary antrum. *Arch. internat. de laryng., d'otol.*, etc., vol. xiv., No. 1.

89. **De Carli, Deodato.** Three cases of inflammation of the frontal sinuses. *Arch. ital. di otol.*, vol. x., No. 3.

90. **Cryer, M. H.** Modes of infection of the maxillary sinus. *Four. Amer. Med. Assoc.*, Nov. 24, 1900.

91. **Douglass, Beaman.** The pneumatic sinuses in the sphenoidal wings. *The Laryngoscope*, Feb., 1901.

92. **Hamilton, W. D.** Growths in the frontal sinus. *Four. Amer. Med. Assoc.*, Jan. 26, 1901.

93. **Grant, Dundas.** Case of alveolar epithelioma of the ethmoidal cells and antrum. *Proc. Laryng. Soc.*, London, Nov. 2, 1900.

86. It has always been thought that acute empyema of the accessory cavities does not heal, because of impeded outflow of the discharge. **AVELLIS** gives another cause. There are acute cases of accessory-sinus disease where the bone is exposed, superficially necrotic, and covered with granulations. These cases are peculiar, owing to a great increase in the pain, and do not heal after the usual nasal treatment. The customary trephining with free drainage suffices, so that an obliteration of the cavity, as in chronic cases with mucous ulcer and granulations, is unnecessary, and the disfigurement of the patient can be spared.

ZARNIKO.

87. The author has found that the maxillary antrum, as well as the sphenoid sinus, may send prolongations into the other, and the cavities need only be separated by a thin wall. The posterior ethmoid cells directly adjoin the maxillary antrum to a large extent, and occasionally there is a direct communication between an anterior ethmoid cell and the antrum of Highmore.

The clinical importance of these conditions is emphasized (transmission of infection, possibility of resecting the ethmoid and sphenoid from the antrum [Jansen]).

ZARNIKO.

88. The suppuration of the sphenoid cavities is diagnosed after removal of the middle turbinal. The healthy left antrum of Highmore is opened through the canine fossa and access is made to the choana through the inner wall. The lower wall of the sphenoid cavity was chiselled away, an opening made through the median wall, exposing the other sphenoid cavity. Gauze packing was introduced through the nose; the opening into the antrum was closed by suturing the mucous membrane. Healing in fourteen days. This method is recommended when the nose is narrow, the antrum is also affected, and extension to the brain is feared.

SCHWENDT.

89. The first two patients were syphilitic and suffered from an inflammation of the frontal sinus (pain in the forehead, super-orbital swelling). In the one, antisiphilitic remedies were of no avail, the sinus was trephined, and the discharge ceased in two months. In the other, both frontal sinuses were involved; the anterior walls had been destroyed, so that irrigation was possible. Antisiphilitic and local treatment led to a cure. In the third case operation was refused, so intranasal treatment was instituted.

RIMINI.

90. CRYER first dwells upon the development of Highmore's antrum, and then demonstrates by twelve excellent illustrations, continuing those shown in previous papers, how great the variations may be in the nasal chamber, the maxillary, frontal, and sphenoidal sinus, as well as in the cells of the orbital process of the palate bone and the ethmoidal cells. Infection is usually conveyed through the common communication with the other accessory sinuses to the antrum, and by resorption of bony partitions. Teeth are lost rather through disease of antrum than primarily diseased, causing infection of the antrum.

M. TOEPLITZ.

91. DOUGLASS investigated the relations of the pneumatic cavities in two hundred cases, and found that *a*, in 15.5 % the great sphenoidal sinus was entirely confined to the body, the small wings always containing pneumatic cells; *b*, in 3.5 % a sinus of the small wing communicated almost exclusively with the posterior ethmoidal cell; *c*, in 84.5 % the great sphenoid sinus extended into the small wings of the sphenoid; *d*, in 4.5 % the posterior

ethmoid cell extended slightly backward into the region of the sphenoidal wings. Examples of the sinuses of the sphenoidal wings are more minutely described, and nine illustrations accompany the paper. In conclusion, the practical bearing of these sinuses is dwelt upon.

M. TOEPLITZ.

92. HAMILTON reports two cases of osteoma of the frontal sinus, the first in a man, aged thirty-six, who was struck on the forehead when fourteen years old. A swelling ensued on the root of the nose, from which, after incision, pus escaped, but which never entirely disappeared, and even increased. The forehead showed an enlargement, extending from the line of the brows above the frontal eminences and laterally to the angular processes, irregular in contour, measuring transversely $3\frac{1}{2}$ ", vertically $2\frac{1}{4}$ ". The osteoma could not be shelled out, and was removed piecemeal with saw, chisel, and rongeur forceps; it weighed $4\frac{1}{2}$ ounces. Recovery. The second case occurred in a man, aged twenty-seven, who had noticed a protrusion at first three years before admission. It was directly above the nasal process of the frontal bone, of the size of a walnut, and flattened slightly from one side to the other. He also had double exophthalmus, especially of the left eye, with divergence, double optic neuritis, inability to read, and threatened blindness. L. retina striated and on nasal side patch of choroiditis. An osteoma of softer consistency was found in the frontal sinus, together with polypi and pus, which were in contact with the dura mater. The roofs of the orbits were destroyed.

M. TOEPLITZ.

93. A woman aged fifty-three years was seen in October, 1900, on account of blocking the left nostril, loss of smell, with pain in the left nostril and cheek and swelling of the left cheek and in the orbit, pushing the left eye upwards and outwards.

The illness was of nine months' duration, and had commenced with symptoms of cold in the head and the formation of a polypus. A microscopical examination of removed tissue showed it to be alveolar epithelioma. The growth was removed by exposing the superior maxilla. The disease was found to have eaten away the anterior wall of the antrum and a large portion of the floor and inner wall of the orbit. The whole of the diseased tissue was scraped away from the ethmoidal cells, the lachrymal bone and os planum being almost completely removed. As the floor of the antrum was found to be free, the alveolar and palatal processes were left in position.

ARTHUR CHEATLE.

f.—OTHER AFFECTIONS.

94. **Felix.** Lupus of the upper respiratory mucous membrane. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

95. **Dietsch.** On the etiology of hay fever. *Deutsche med. Wochenschr.*, No. 7, 1901.

94. This is a careful compilation of the literature on lupus of the upper air passages and a description of twelve cases.

ZIMMERMANN.

95. The author, himself a sufferer from hay fever, does not regard this malady as an infectious disease, but caused by pollen. A predisposing factor is an irritability of the nervous system and probably an arthritic constitution.

NOLTENIUS.

g.—NASO-PHARYNX.

96. **Botey.** Pseudo-hæmoptysis of naso-pharyngeal origin. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

97. **Poljakow.** On latent tuberculosis of the pharyngeal tonsil in sucklings. *Dissert.*, St. Petersburg, 1900.

96. BOTEY published six cases to show that an hæmoptysis may be simulated by bleeding from the roof of the naso-pharynx. A chronic pharyngitis and rhinitis sicca were present in four of the cases; otherwise there was no anomaly.

ZIMMERMANN.

97. POLJAKOW endeavors to answer the two following questions: 1. How frequent is latent tuberculosis of the pharyngeal tonsil in sucklings? 2. Is tuberculosis a factor in the etiology of adenoids? Fifty tonsils of children up to one year were examined. Conclusions: 1. Hyperplasia of the pharyngeal tonsil occurs in the earliest age. 2. The form of hyperplasia differs from that called adenoids; the tonsils are almond-shaped with furrows. 3. Tuberculosis is not an active factor; tuberculous changes were found in four out of the fifty tonsils, and the most enlarged tonsils showed neither in their own structure nor in the body elsewhere any tuberculous lesion. 4. In the tuberculous bodies, the tonsils showed changes in one third of the cases. 5. There was one case of undoubted primary tuberculosis of the pharyngeal tonsil. 6. In all cases of tubercular infection of the pharyngeal tonsil, the lesion was not apparent, hence latent in distinction to the ulcerous form. 7. In all tubercular tonsils, many tubercle bacilli were found. 8. The general condition of the body has very much to do in causing tonsillar hyperplasia; the largest tonsils are found in rhachitic and marasmic children.

SACHER.

SOFT PALATE, PHARYNX, AND MOUTH.

98. **Strazza.** Retropharyngeal abscesses in sucklings. *Arch. ital. di otolog.*, vol. xi., No. 2.
99. **Mangubi.** On the function of the tonsils. *Wratsch*, No. 44, 1900.
100. **Kelly, A. Brown.** Sclerotic hyperplasia of the pharynx and nasopharynx. *Lancet*, April 6, 1901.
101. **Goodale, J. L.** Retropharyngeal abscess in the adult. *Boston Med. and Surg. Journ.*, Jan. 31, 1901.
102. **Chappell, Walter F.** Hemorrhage from a circumtonsillar abscess. *N. Y. Med. Journ.*, March 2, 1901.
103. **Lincoln, Rufus P.** Supplementary report on a recurrent tonsillar tumor. *N. Y. Med. Journ.*, Oct. 27, 1901.
104. **Koenig, Augustus.** Adhesion of the soft palate to the posterior wall of the pharynx. *Phila. Med. Journ.*, Feb. 16, 1901.

98. STRAZZA divides retropharyngeal abscesses into those which are situated behind the fibrous membrane forming the pharyngeal wall, extrapharyngeal, and those intrapharyngeal, in the wall itself. The extrapharyngeal occurs in adults after caries of the vertebræ; the intrapharyngeal in children, and especially sucklings. In the extrapharyngeal, the opening should be made externally anterior or posterior to the sterno-mastoid, whereby better drainage and direct treatment of the caries is possible. The intrapharyngeal in sucklings make the clinical appearances of the phlegmonous angina of adults. Strazza first opens the abscess through a curved trocar and enlarges the opening with a blunt-pointed knife.

RIMINI.

99. MANGUBI removed the tonsils in dogs and let them inhale septic material; he also injected diphtheria toxin and cultures. The dogs suffered from diarrhœa and vomiting, while the control dogs remained healthy. After removal of the tonsils, the blood was altered: continuous hypobiocythosis, decrease in red blood corpuscles and hæmoglobin.

SACHER.

100. KELLY bases his paper on one case, and claims to have described a hitherto undescribed pathological entity. A man aged thirty-four years has been subject to slight attacks of sore throat for about eight years. Three years before examination he began to feel something in the pharynx which he wished to expel. Latterly choking fits had been excited by "something" coming forward on the tongue or passing too far back. Nasal obstruction was also noticed. On examination, the uvula hung down like a curtain concealing the posterior pharyngeal wall, its length was over $1\frac{1}{4}$ inches, its width at the base 1 inch, and it was also

greatly thickened. The color was pale and the consistence fibrous, forming a firm, unyielding mass. On bringing the uvula forward, the posterior wall of the pharynx presented the following appearance: A narrow tract of apparently normal tissue ran down the middle of the posterior wall; on each side of this, extending outwards to the lateral wall, and incorporating with it a part of the right and the whole of the left posterior faucial pillar, was a broad, prominent band, which was thicker in its outer part. These bands passed upwards into the naso-pharynx and downwards to the top of the œsophagus. Their consistence was that of muscle, and they could be pushed en masse towards the mid line. Their color was gray and their surface smooth.

The lumen of the naso-pharynx was much reduced. A mass of thickening was present in the adenoid region, but was least marked in the centre. The greater part of the uvula was removed. Sections showed that the uvula consisted of dense connective tissue of sparsely cellular character and fibrillated in appearance; surrounding the majority of the vessels were dense areas of leucocytic infiltration. The surface epithelial cells had undergone a change comparable to that in the keratinous layer of the epidermis. A long microscopic report is given by A. R. Ferguson.

The bacteriological examination was negative.

Kelly concludes:

1. That the pharynx and naso-pharynx may be the seat of a sclerotic hyperplasia unconnected with syphilis, rhinoscleroma, or other known infective disease.

2. That a similar morbid process may manifest itself beneath the vocal cords as subglottic hypertrophic laryngitis.

3. That in the hyperplastic variety of hereditary syphilis the histological appearances closely resemble those of the described sclerotic hyperplasia.

ARTHUR CHEATLE.

101. In a man, æt. eighteen, a swelling slowly developed in four weeks over the entire posterior pharyngeal wall, fluctuating and extending downward from the level of the soft palate, without fever. By incision about four ounces of pus were evacuated. A guinea-pig injected with a bouillon suspension of the pus died after seven weeks from tuberculosis. The pus contained tubercle bacilli. There was no evidence of disease of the cervical vertebræ. The patient recovered and remained in good health.

M. TOEPLITZ.

102. A man, æt. twenty-seven, had in two years two attacks of

quinsy. After the second, the internal and external swellings remained for five weeks, in spite of four incisions made, the abscess pointing in the middle of the posterior pillar of the soft palate, which, when opened, released one half ounce of foul pus. Four days later, a hemorrhage of six ounces, followed after four hours by another of eight ounces, and after five days by a third of eight ounces, which was controlled by a large incision through the anterior surface of the soft palate and backward to the abscess cavity, which was packed. The ascending pharyngeal artery was seen at the outer and rear wall of the cavity. Examination of the urine revealed the presence of nephritis. Two days after the last hemorrhage an attack of rheumatism set in. Recovery.

M. TOEPLITZ.

103. LINCOLN's patient, a male, æt. forty-five, had in 1897 been reported by Delavan for an ulceration of the much indurated left tonsil, which was removed and microscopically found to be syphilitic. A year later, Lincoln observed in the region of the left tonsil a non-ulcerated hard tumor occupying half of the pharyngeal space. After dissecting the pillars from the tumor the whole mass was enucleated and found to consist of granulomatous, syphilitic tissue, while another microscopist does not believe the evidence to be conclusive. There was no return of the tumor for eighteen months after removal.

M. TOEPLITZ.

104. A man, æt. thirty-four, contracted an adhesion of the soft palate to the posterior pharyngeal wall, when eleven years old, through an ulcerated sore, lasting eight months and extending from the right side to one half inch of the left side, leaving scarcely room enough for the admission of a retractor. The parts were begun to be separated under cocaine with a pair of curved scissors and an instrument with the curve of a Gottstein curette and a double lateral cutting edge. A plug inserted by means of Bellocque's canula remained for forty-eight hours and was replaced by a hollow silver plug made to fit the cavity. Healing took place in three weeks.

M. TOEPLITZ.

BOOK NOTICES.

IV.—Transactions of the Otological Society of the United Kingdom.

Vol. I. First Session, 1899-1900. (With list of Officers, addresses of Members, and Rules and Regulations.) Edited by CHARLES A. BALLANCE, M.S., F.R.C.S., and ARTHUR H. CHEATLE, F. R. C. S. London : J. & A. Churchill, 7 Great Marlborough St., 1900.

A well-gotten-up small octavo of seventy-four pages of text, nine illustrations (two in the text, seven on six plates of glazed paper), accompanying the articles, and an index of authors and subjects.

This little volume, the first annual report of the British Otological Society, contains a good deal of interesting and important reading matter, even after the extensive magnificent report of the unexcelled Sixth International Otological Congress, held the year before in London. The list of officers is : President, Sir Wm. Dalby. Vice-Presidents : U. Pritchard, Thos. Barr, Geo. Field. Secretaries : C. A. Ballance and A. H. Cheatle. Librarian : E. C. Baber. Treasurer : A. E. Cumberbatch. The Society, in its first year, consisted of sixty-two ordinary members and one honorary member (Adam Politzer, of Vienna).

The Rules and Regulations for the conduction of the Society are judiciously considered and carefully drawn up. We abstract the most important.

The election for membership is based on the following requisites on the part of the candidate : *a.* Contributions to otology. *b.* Special opportunities to advance otology. *c.* Professional eminence.

The Council (six members) has the power of electing men of distinguished eminence in otology as honorary members, whose number shall not exceed six. The Council has the power of fill-

ing any vacancies in the offices of the Society that may occur between the last and the next annual meeting.

The President and the Vice-Presidents shall not serve for more than two consecutive years.

The Secretaries shall be the Editors of the *Transactions* under the direction of the Council.

All papers shall be handed to the Secretaries immediately after having been read.

Each member taking part in any *discussion* shall write on a form, provided for the purpose, an abstract of his remarks, which shall be given to the Secretaries before the end of the meeting.

Every paper read before the Society shall be the exclusive property of the Society, and the author shall not be permitted to withdraw it, except by permission of the Council. If, in contravention of this rule, a paper read before the Society, be published elsewhere by the author, it shall thereby be disqualified for admission to the Society's *Transactions*.

An abstract of each communication, for publication in medical journals, shall be given to the Secretaries at the end of the meeting.

The Society holds four Ordinary Meetings, at 4 P.M., on the first Monday in December, February, March, and May, in London, or elsewhere, as the Council may decide.

The First Ordinary Meeting was held in London, Feb. 5, 1900. The presidential address was read by the Chairman, Sir William Dalby, of which the reviewer begs to mention some sentences. "I think what chiefly would be noticeable to a lay visitor of this assemblage of aural surgeons, would be the comparative youth (with a few exceptions) of the members. The reason is not far to seek. It is only of recent years that the progress of aural surgery has reached such a point as to attract young surgeons of good abilities and prospects to devote their lives to its practice. . . . Twenty-five years ago, only three or four of the London hospitals had aural surgeons on their staff. . . . The bulk of the ear patients went for treatment and cure to those surgeons that professed to treat and cure, and confined themselves to professing, for there was nothing beyond." This statement is too sweeping. It is quite true that twenty-five years ago there was no mastoidology, but there was, scientifically and practically, quite a respectable otology. The anatomy and physiology of the hearing organ, much older than twenty-five years, dates back to the

great Italian and French investigators, and for the search of the men who were the founders of the clinic and pathology of ear disease Sir William need not look far about: he will find the best names in the United Kingdom (W. Wilde in Dublin, and two others, Toynbee and Hinton, in his own residence, on Saville Row, London). It is true that the great achievements of operative otology are of recent date and represent only a branch—one of the most intricate and difficult, indeed—of modern ear surgery, which owes its origin to the work of Lister, and its accuracy to the anatomical researches of Tröltsch, Schwartze, Politzer, etc., whereas its methods refer to Schwartze, Zaufal, Küster, Stacke, Horsley, Barker, Macewen, Ballance, and a great many others. The suppurative affections of the middle ear, their intracranial complications and vital consequences, occupy at the present day the centre of interest in otology, overshadowing by their practical importance, their extension, and their difficulty of treatment all other questions. The special aim of the aurist must be to preserve as much of the hearing power as is compatible with safety of life.

“On this intensely interesting question—Sir William says—we are now going through a crisis, a revolution in surgery,” and he adds, when we are depressed by our failures, these consoling words: “Let us remember that in all revolutions, however righteous, some mistakes must be made, for the man that makes no mistakes achieves nothing.”

After this discourse the papers and discussions follow. We need not here enter into abstracting them, for they have been made known to our readers by reports furnished by one of the Secretaries, Mr. A. Cheatle. The papers, as well as the discussions, are distinguished by their unusually practical contents and the concise and clear diction. The unsurpassed opportunities of observing and handling most important and varied cases of disease, and, on the part of the patients, their practical sense, national bravery, lack of nervousness, and their generally vigorous constitution, give the English surgeon a great advantage over his continental and transatlantic confrères. This statement may be verified on almost every page of the book before us. In the three meetings of last year there were thirty communications, more or less extensive, some very short, with demonstrations of illustrations and specimens, all instructive, and the majority of the communications, brought out in the discussion, were other similar observations con-

firmative of or sharply different from the results obtained by members as well informed and skilled as the speakers themselves. Good case-taking is a distinctive feature of English medical literature; to name an example familiar to all of us—the reports of cases in W. Macewen's book on *Infective Diseases of the Brain* are classical models; no essential feature is missing, and all irrelevant statements or remarks are omitted.

Every aurist will read the *Transactions of the Otological Society of the United Kingdom* with interest and profit. H. K.

V.—**Oreille et Hystérie.** With eighty-four diagrams in the text. By DR. FLEURY-CHAVANNE. J. B. Baillière et Fils, Rue Hautefeuille 19, Paris, France. 1901. Price, frs. 7.50 (\$1.50).

This monograph of 320 large-octavo pages is well printed on good paper, and deals exhaustively with a subject little known but of great practical importance. The author has been induced to write this monograph, and he has been greatly assisted clinically, biographically, and critically by his teacher, professeur agrégé à la Faculté de Paris, Médecin des Hôpitaux. At first sight, the reviewer received the impression that the book was another of those long-winded literary productions—so common in continental Europe—in which a subject of restricted interest is given an inordinate amount of space. The beginning of the book partially confirmed this suspicion by the detailed descriptions of all the methods of examining the hearing function—voice, watch, acoumeter, tuning-forks in all their varieties, galvanic reaction—which are contained in every modern text-book of otology, with the acquaintance of which the author might fairly have credited the reader. And yet, even this introduction may not be unwelcome to a number of aurists. The historical remarks, showing that the subject has long received considerable attention, are quite interesting. The second chapter division of the subject begins with this transcendental statement¹: "From the foregoing exposition it follows that aural hysteria comprehends all the modes of reaction of the ear under the influence of the neurosis. As to the intimate nature of this reaction, it is that of hysteria itself, namely, one of those encroachments of the unconscious upon the conscious, which constitute the basis of the psychic process of hysteria" [*un de ces impiétements de l'inconscient sur le conscient, qui foment le fond du processus psychique de l'hystérie*]. This sentence

¹ The passages put in quotation marks are literal translations.

is so imposing that it might have been written by the long defunct, celebrated German philosopher Hegel, whom a students' song so divinely ridicules. Apart from this, we can speak only commendingly of the book, which is divided into three parts and nine chapters. The second part begins with the *aural syndrome of hysteria*, according to different authors: Walton, Thomsen, Oppenheim, Lichtwitz, Gradenigo, and others, criticising their statements by citing the cases and remarks in their own publications. Then there follow the histories of thirty-six cases who presented ear symptoms out of fifty successive hysterical patients which Lannois had in his service and gave the author to examine. The latter gives the results of twenty-five of his examination, and adds them to a synopsis (pp. 112-113) containing the results obtained by the above-named authors. On page 27 is a diagram of the notation of tones by letters and numbers of vibrations. He says that the German-English system (letters C², C¹, C, c, c¹, c², c³, c⁴, counting by v. d. = double vibrations) more and more generalizes itself, whereas the French system, v. s. (single vibr.), is "still used in France, and deservedly so, because it was introduced by Gui d'Arezzo, from whose musical reform the gamut takes date." Aside from that, it avoids inconvenience and confusion from using large and small capitals. In the French system the above letters correspond to ut₁, ut₂, ut₃, ut₄, ut₅, ut₆ (p. 27). The author in his examinations uses these six tuning-forks, and gives the results in Hartmann's diagrams, graphically expressing percentage values. In the synopsis of cases he records the sensibility of the general integument, that of the external auditory canal and tymp. membrane, the acuteness of hearing for voice and whispering speech of each ear, the lateralization of sounds by Weber's test, and the air- and bone-conduction of Rinne's test. The clinical histories are carefully written. At the end of each part the case-histories are critically and comprehensively discussed.

The second part is divided into two categories: *otic symptoms in such patients as have only general symptoms, promiscuously, e. g., the well-known stigmas: great excitability, globus hystericus, fits of different kind and extension; irregular areas of hypoæsthesia and anæsthesia as to pain, heat, and touch; hysterogenous areas, touching of which will produce hysterical symptoms, especially spasm, such areas, among others, being the naso-pharyngeal mucous membrane, the regions above and below the breast, and*

especially that over the ovaries and testicles ; all kinds of paralytic and emotional manifestations ; in fact, there are no subjective symptoms, sensory and psychical ones included, that hysteria may not copy. The case-histories collected by the author furnish abundant evidence of the proof of this assertion. The sensibility of the skin of the outer ear and tympanic membrane is examined with a delicate probe, that of the E. tube and tympanic cavity by inflation, the catheter, and bougies, that of the mastoid by pressure. It should not be forgotten that the mastoid is also one of the hysterogenetic areas. Every experienced ear surgeon knows that pressure-pain, even when combined with some redness and doughy swelling over the mastoid, has been a part of the indications for extensive operations in which the mastoid was found perfectly healthy. On the other hand, we must be on our guard not to mistake aural and intracranial symptoms of organic disease for hysterical ones. A striking example of such happenings is contained in the valuable article on otitic meningitis, by Dr. Jacob Cohn, of Breslau, published in the present number of these ARCHIVES. From the case-histories in this part it follows that the degree of the aural symptoms—for instance, the deafness—is in no relation to the general symptoms of hysteria.

This holds good also for the second group, in which the patients suffered from hemihypoesthesia or hemianesthesia. The insensibility of the mucous membranes, however, is in closer relation to that of the skin than the degree of hearing is. The existence of unilateral deafness associated with hemianesthesia cannot be doubted. Gellé, among others, has published several absolutely clear cases of that variety. It is well known that Gellé, while studying metallotherapy at the Salpêtrière, discovered the possibility of the transfer of the acoustic sensibility of a well-hearing ear to that of a deaf, or almost deaf, ear. The same possibility of transfer exists in all kinds of hysterical anesthetics. The hearing function may differ in different ways ; there may be a more or less uniform degree of impairment, as well as absolutely circumscribed areas in the range of audition (tone gaps, lacunæ). In accordance with Lichtwitz and Gradenigo, Fleury-Chavanne has found the Rinne always positive in hysteria—which demonstrates the nervous nature of hysteria. It is the same with Gellé's, Bing's, and Corradi's tests (centripetal pressure, secondary sensation, and restored sensation). They show that the hearing acuteness in hysteria undergoes considerable variations, and

intermissions of deafness are frequent, which proves that the deafness in those cases is a phenomenon of exhaustion. In rare cases hysterical deafness appears in the form of the paracousis of Willis.

The *third part* describes *hysterical deafness* as a single symptom of hysteria, *l'hystérie auriculaire monosymptomatique*. Deafness is either the only or at least the preponderating symptom of hysteria. These cases are rare. They may be one- or double-sided. It may be the only symptom in the whole history of the case, or it may "accompany the symptoms of the neurosis covering for a moment the diverse chords, or it may awake dormant hysteria, which will then evolve even after the aural disturbance has disappeared." Its causes are the customary ones: emotion, fright, anger, suggestion, overwork, worry, etc.

Deaf-blindness (surdy-cecity) is extremely rare. No objective symptoms to be found in ears or eyes. Speech is frequently imperfectly articulated. The prognosis is favorable. The diagnosis rests chiefly on the sudden appearance, the lack of organic changes, and the appreciation of the patient's temperament, and other nervous symptoms. *Treatment* should begin as early as possible. *Suggestion* is an infallible cure, which every one may administer according to his liking, considering the conditions of the case. *Deaf-mutism* is one of the rarest manifestations of hysteria. Some cases in literature are of early date. Mercuriale mentions that Maximilian, son of Emperor Henry III., was a deaf-mute who, at the age of six years, recovered his voice, which he afterward used so brilliantly.

The reviewer has treated a girl of four years, mother highly nervous, rather dull and melancholic. The child did not speak, and pretended to be deaf. Physical examination negative. Without any other treatment than a gargle, she gradually recovered her hearing and speech. She is now about twenty-five years old, strong and well. Never complained of her ears again.

Hysterical deaf-mutism occurs in about equal proportions in different countries, but decidedly more in men than in women, 75 to 80 %. It may be monosymptomatic, or accompanied. It always disappears, mostly in a few days, or in some weeks or months, exceptionally in years. Treatment, as usual, in hysteria. "Ortolani has seen a case recover spontaneously under the influence of copious libations! In this time of leagues against alcohol, I should not dare recommend this mode of treatment."

Electricity, with a written suggestion previously handed to the patient, counts the greatest number of successes to its credit.

Otic Algies, as the author calls the hyperæsthesiæ of the different parts of the auditory organ, may be caused by hysteria in all varieties and degrees. He describes them under the following heads.

1. *Hyperæsthesia of the ear*: (a) sensitive, (b) sensory. The latter is subdivided into (1) true, (2) painful hyperacousis. The reviewer thinks that the first variety, hyperæsthesia auditiva, if it exists at all, is of no practical significance, whereas the other hyperacousis, or, better, hyperæsthesia auditoria dolorosa, is a condition more than exceptionally observed. It may be produced by one special noise, *e. g.*, on the crumpling of paper (Lannois). Gradenigo lays stress on the continuity of weak but continuous sounds—for instance, the ticking of a watch,—whereas strong but not continuous sounds are tolerated without special reaction. The reviewer has had totally different experience.

A lady of about thirty years was extremely distressed by short, explosive sounds, especially that of firearms, so that she would never see a theatrical performance in which there was a single shot. The explosion was not only a painful shock, but it caused also trembling, spasms, convulsions, and other nervous symptoms. The over-excitement of the acoustic nerve brought about a regular hysterical reaction.

The ear, therefore, is one of the

II. *Hysterogenic zones*, to which the author devotes a special paragraph (p. 198, etc.).

The single parts of the auditory apparatus may produce hysterical symptoms, to which special words have been given, *e. g.*, spasmogenic, hypnogenic, lethargogenic, etc.

III. *Hysterical vertigo of Ménière* should be distinguished from the ordinary vertigo of Ménière, inasmuch as to the triad of Gruber (hardness of hearing, tinnitus, and dizziness) it adds the stamp of hysteria by the presence of the symptoms of this neurosis, frequently with absence of organic changes in the hearing organ. Fleury-Chavanne dwells on this point and supports his statements by conclusive cases, personal as well as others. The two forms of Ménière's disease, the ordinary and the apoplectic, are represented also in the hysterical kind. Prognosis favorable; treatment symptomatic and by suggestion.

IV. *Hysterical otalgia* is rarely idiopathic, but mostly brought

about by affections of neighboring parts, *e. g.*, pharynx, larynx; nose, teeth, and different parts of the ear itself. These are the true cause of otalgia; hysteria only enforces their action.

v. *Hysterical mastoidalgia*. — Pain on and without pressure, even with some swelling and redness, always makes us think of mastoiditis. The absence of fever and of acceleration of the pulse will make us pause. Even if there is trouble in the ear itself, the pain may not be caused by it, but be one of the manifestations of hysteria. Before resorting to the knife, we should look out for the erratic symptoms of neurosis and, if there are any, apply antihysterical treatment, which, *ex juvantibus*, will bring us nearer to the correct diagnosis. As we mentioned above, the greatest errors have been made in this respect, and the author cites several striking and warning examples. The addition of a clear picture of hysteria should decide our action. Nevertheless we should not forget that a true mastoiditis, requiring operation, may occur in hysterical patients, and mastoid neuralgia in confirmed sclerosing mastoiditis is cured by even partial opening of the mastoid.

The next chapter (VIII.) is devoted to **Hysterical Otic Hemorrhages**. They are not accidental, but in connection of cause and effect with hysteria.

1. Most frequently they are *in relation with menstruation*, to which they are either *supplementary* or *complementary*. In the former case, they are a variety of the well-known vicarious hemorrhages in different organs; in the latter, they add themselves to, or alternate with, a more or less irregular menstrual flow. Here two old cases in illustration (p. 256).

Dr. Jouilleton, 1813, says: Several times I have seen a woman, about thirty-five years old, who, for five years after abortion, has been menstruated through the right ear. A few days before the flow the ear was very painful.

Pinel, 1817. Miss A., since her twelfth year, hysterical crises, hematemeses. Then suppression of menses, which are replaced by hemorrhages located successively at the thumb, the legs, the inner canthus of the eye, the eyelid, navel (for five months), the left inner malleus (2 mos.), the left ear (2 mos.). When the blood did not escape through any fixed channel, epistaxis and hematemeses. Finally the menses reappeared.

In some cases, in spite of the amenorrhœa, or dysmenorrhœa, the search for hysteria is negative, as in the case of Lermoyez (p. 261):

No stigmas, no true periauricular anæsthesia, only some hypo-æsthesia in the right ear canal (the right ear is the seat of the hemorrhage).

A good illustration of the complementary menstrual oto-hemorrhage is by Eitelberg (p. 265).

Flow always through R ear.

June 24, 25, 1887, oto-hemorrhage ; in the evening of the second day the menses appear.

Fig. 1.

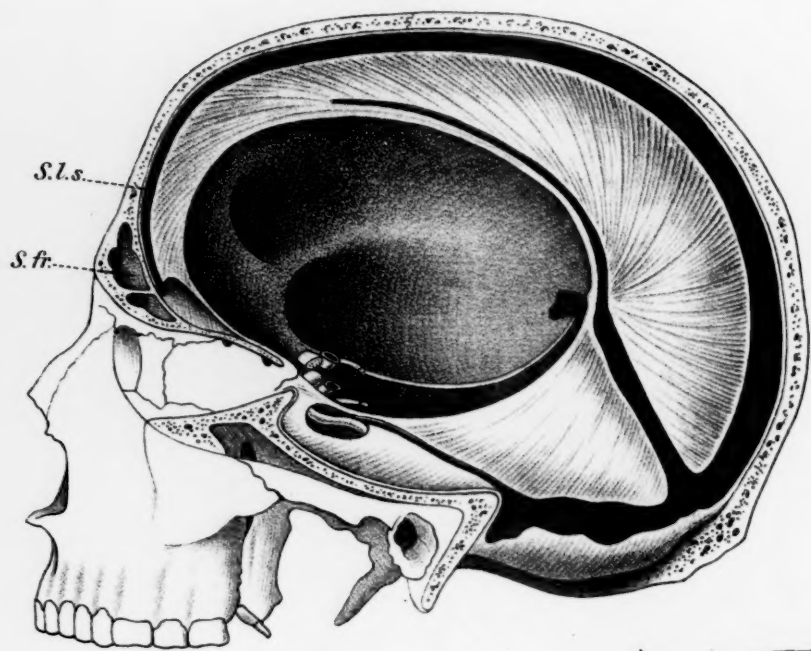


Fig. 6.

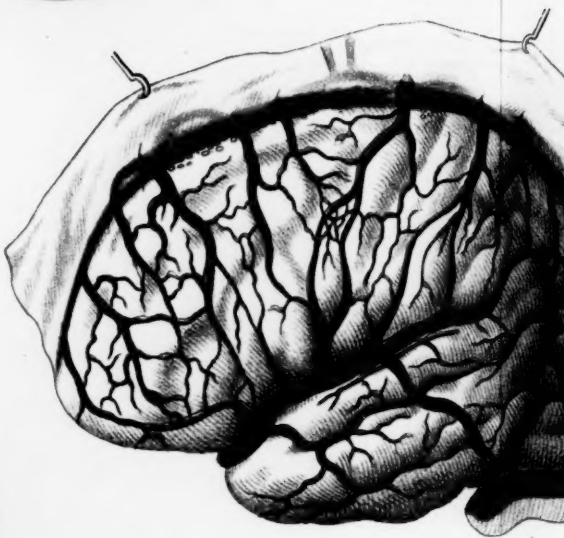


Fig. 4.

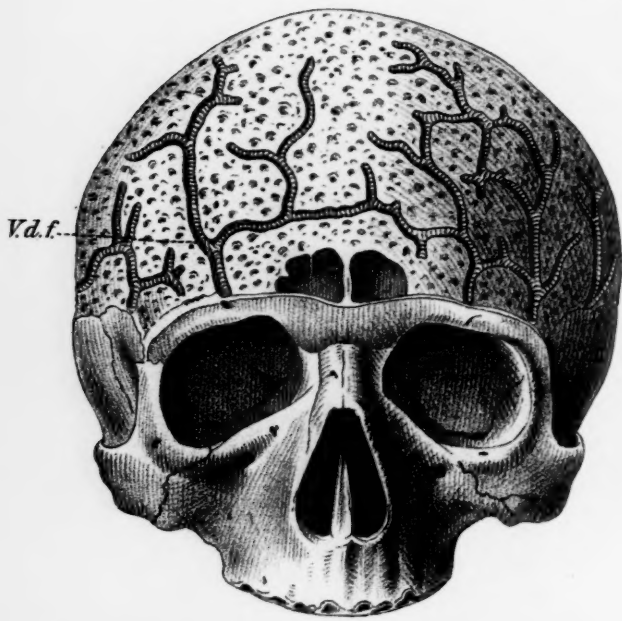


Fig. 3.

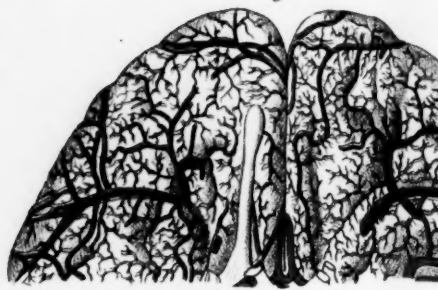


Fig. 5.

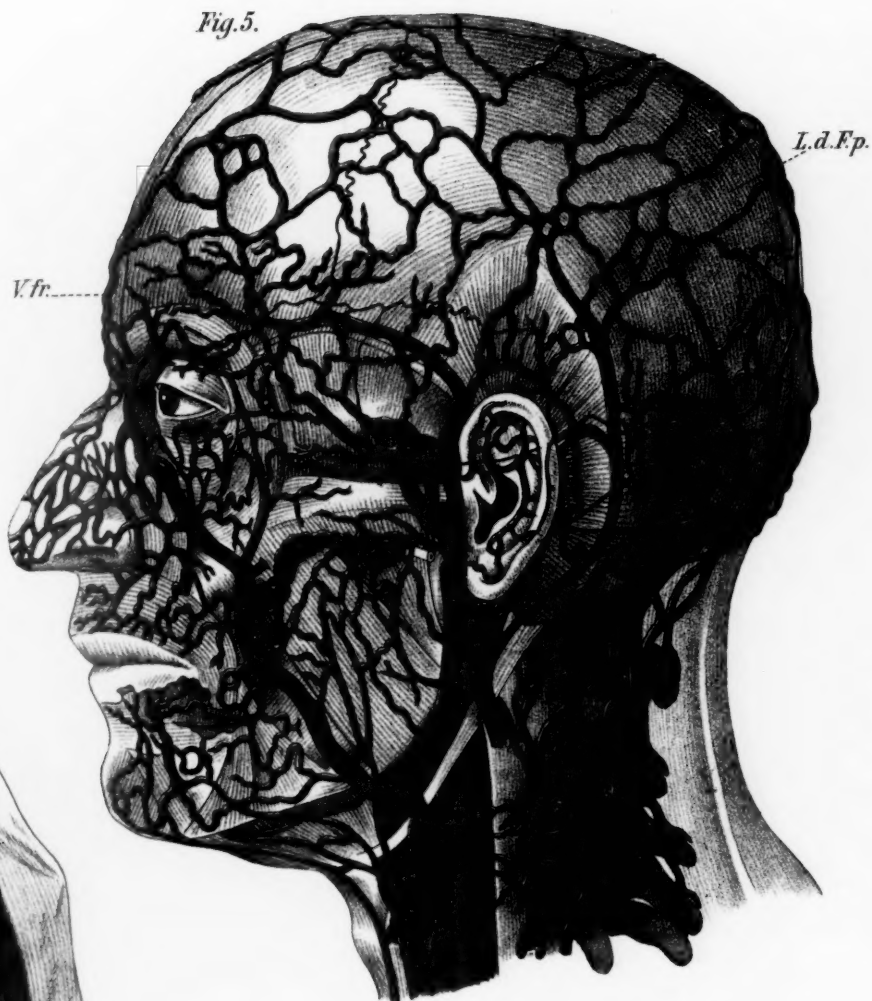


Fig. 2.

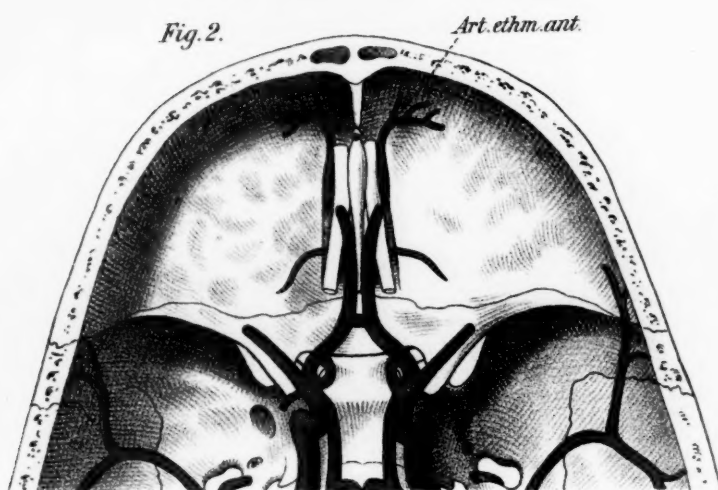




FIG. 1.—Micro-photograph of section of the growth, the seat of a calcareous degeneration, removed from the middle-ear.



FIG. 2.—Same as Fig. 1. More highly magnified. The striated character of the growth is more plainly seen.